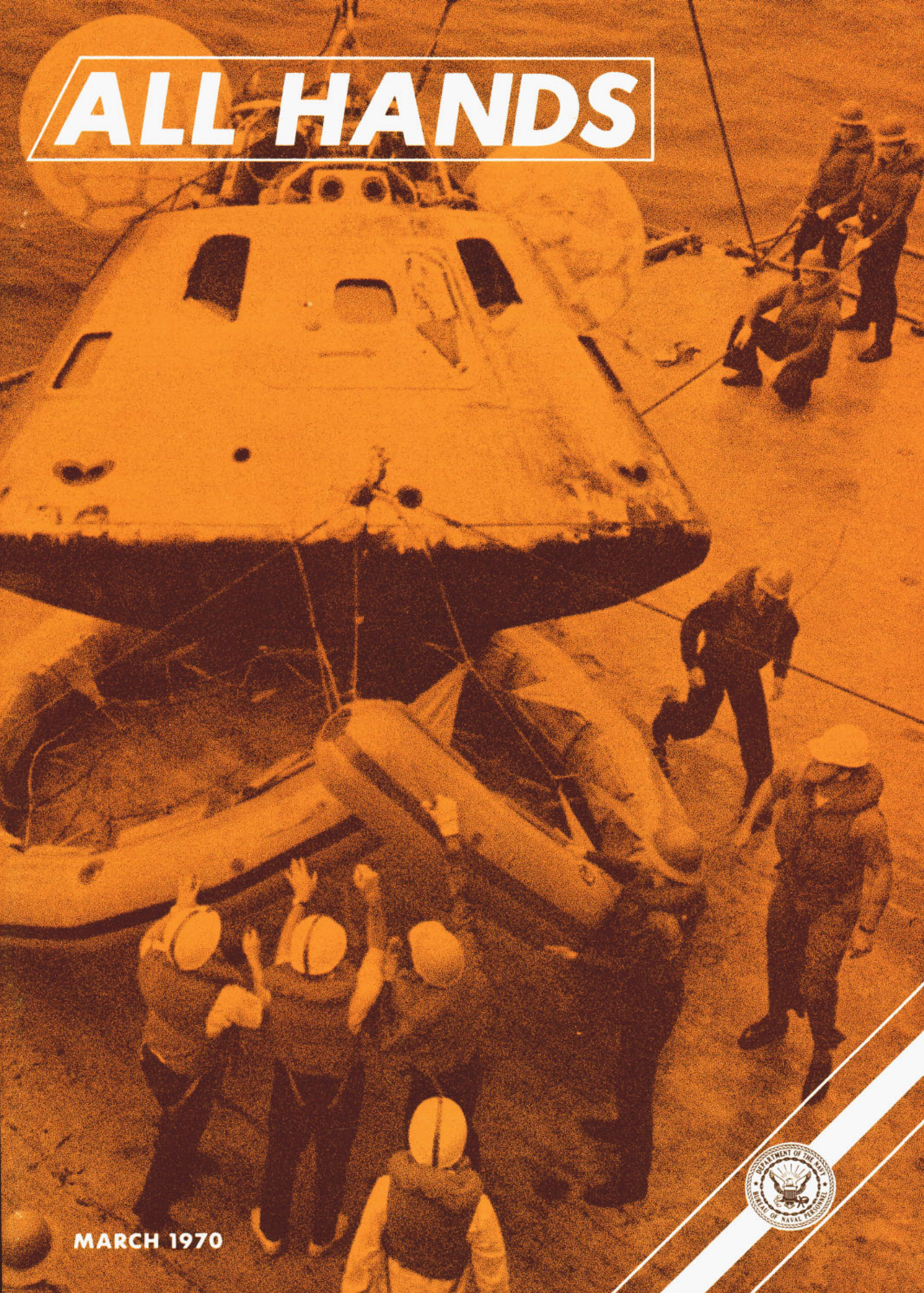


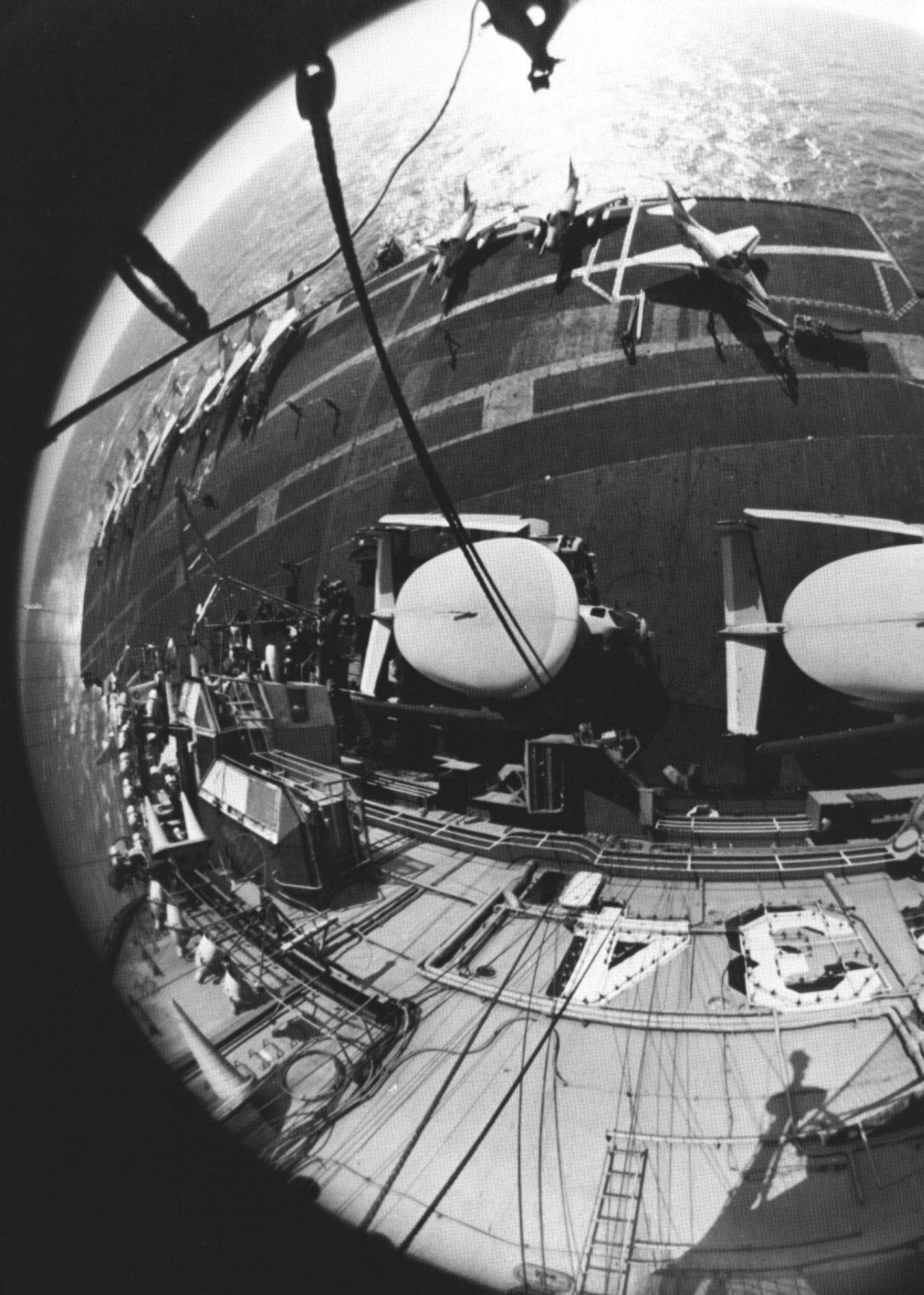
# ALL HANDS



MARCH 1970









# ALL HANDS

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• **FRONT COVER: NAVY'S ROLE IN SPACE** ranges from the seas of earth to the "seas" of the moon. The cover shows an early Apollo spacecraft brought aboard a Navy carrier after splash-down. The Navy has played a variety of roles in the development of America's space program from its beginning. They range from launching of satellites to pickups at sea of all the astronauts since the Mercury program.

• **BACK COVER: MEN OVER THE MOON**—The Apollo 11 Command Module, as seen from the Lunar Module shortly before man's first landing on the moon.

• **AT LEFT: THE MIGHTY 'O'**—Flight deck of the Seventh Fleet carrier USS Oriskany (CVA 34) is seen through the fisheye lens of the camera of Chief Photographer's Mate Neal Crowe, USN.

Way, Way Out in Space: An "extragalactic nebula," that is, a large group of stars outside our own galaxy.



*The following report is from an address by Rear Admiral Thomas B. Owen, USN, Chief of Naval Research. The report highlights the new research horizons and the interrelation, scientifically speaking, between space and the sea. Presented before the American Institute of Aeronautics and Astronautics, it points up the Navy's long association in these two fields. Here are excerpts relating particularly to the Navy's scientific efforts in outer space.*

**T**HE OFFICIAL BIRTH of the United States Navy in 1798 was followed some 30 years later by the establishment of an office that included both space and the sea as its areas of interest and jurisdiction.

In 1830, a Depot of Charts and Instruments was

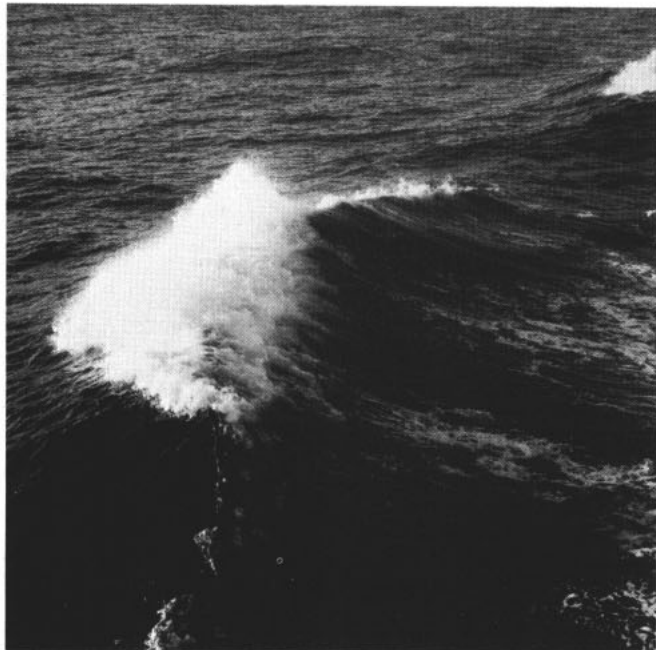
# SPACE

established "to store, maintain and issue charts, sailing directions and navigational instruments for use by Navy ships."

In a very broad and a very practical sense, the Navy pioneers of that era began to conduct "mission-oriented" research both in hydrography and in astronomy in order to meet their chartered responsibilities of providing such charts, sailing directions and navigational instruments. Slowly there commenced a program to gather hydrographic data for nautical charts.

Of equal importance was the objective of acquiring the proper astronomical instruments to make observations of the positions and motions of the sun, moon, planets and principal stars.

**T**HE APPOINTMENT in 1842 of Lieutenant Matthew Fontaine Maury, USN, as Officer in Charge of the Depot was significant. During his 19-year tenure he implemented a system for collecting, analyzing, recording and disseminating worldwide hydrographic data. He also founded the science of oceanography in this country, among many other accomplishments.



Water, Water, Everywhere: 70.8 per cent of Planet Earth is covered with water.



In 1849, the Navy established its Nautical Almanac Office at Cambridge, Mass. This office was later moved to Washington, D. C., and became a part of the Naval Observatory.

In 1854, the Depot of Charts and Instruments was renamed the U. S. Naval Observatory and Hydrographic Office (which was later established as two separate institutions in 1866).

Closely associated with the growth in reputation of the Naval Observatory, commencing in the 1860s, was the distinguished career of Professor Simon Newcomb, a government employee of the Navy Department for over 40 years. His research in celestial mechanics — particularly his theories of motion of the Moon, Uranus and Neptune — made him one of the

house laboratories, and the private industrial scientific groups in those areas of knowledge that seem to be most relevant to long-range Navy requirements.

This very brief outline of some of the highlights of the Navy's research efforts up to the establishment of ONR in 1946 provides the perspective to discuss the 1950s and 1960s and the future. (Excluded has been any discussion of the Naval Material Support Establishment, with its six Systems Commands and many laboratories, which is a most significant part of the Navy R&D program.)

**NRL** EMERGED from World War II with a very special and well-deserved reputation for its many contributions in military R&D, in such areas as radar,

# and the SEA

great scientists of his time, and was instrumental in establishing the quality and effectiveness of the U. S. Navy's *Nautical Almanac* as a navigational tool, still in use today.

**F**OR ALMOST 80 YEARS, this Navy organization, concerned with surveys and research in hydrography and astronomy, underwent little change. In the 1940s, when changes did commence, their impetus could be traced to the fantastic technical achievements in radio, electricity, aeronautics and weaponry of the early 20th century.

A part of this impetus was generated when Thomas A. Edison, in 1915, suggested that the Navy have its own laboratory in which ideas or inventions could be tested and adapted to the peculiar needs of the Fleet. This stimulated the founding of NRL (the Naval Research Laboratory) in Washington, D. C., in 1923.

In 1946, the Office of Naval Research (ONR), headed by the Chief of Naval Research, was established in recognition of the need to plan, encourage and support basic research in our universities, in-

communications, materials and several fields of chemistry and physics.

A new dimension in Navy research in astronomy and astrophysics commenced when NRL pioneered solar rocket astronomy.

In 1946, the first far ultraviolet spectrum of the sun beyond the atmospheric cutoff was obtained. From this beginning, a relatively small research group has since used radio telescopes and rocket and satellite-borne instruments to make astrophysical measurements. Some of the scientific firsts of this NRL Space Sciences Division include:

- The discovery of solar X-ray emission and its role in the production of the ionosphere;
- The detection of X-ray bursts from solar flares and the related explanation of radio fadeout;
- The first short wavelength radar studies of the moon leading to an independently derived distance to the moon;
- The first radio astronomy measurements to indicate the temperature of Venus.

Experiments conducted by the NRL space science



# SPACE and the SEA

and technology groups include special purpose research satellites, and payloads on large, multipurpose satellites such as *Gemini*, and the *Apollo Telescope Mount* (ATM). The continuing cooperation and outstanding support of NASA in all aspects of these experiments has been the key to success in these programs.

The Naval Observatory has continued to do research in the determination of time and in astrometry. The Simon Newcomb Laboratory was dedicated in Washington, D. C., in 1962 and is used to support astrophysical research and researches in the determination of time.

ONR has supported many individual investigators at universities throughout the years since 1946 with its Contract Research Program.

Included in this program has been support for several pioneer investigators in radio astronomy and for such notable individuals as Dr. James Van Allen at the University of Iowa for his radiation belt work. ONR Washington is aided in such work by its alert scientific "bird dogs" — the branch offices in Boston, New York, Chicago, Pasadena, San Francisco and London, England.

**L**T MAURY's mostly two-dimensional ocean of winds, shoals, currents, and waves has increased in depth during the 20th century, and is fully three-dimensional today.

This means to us that the sciences of physics, geology, biology, chemistry, psychology and mathemat-

ics are shifting even more to the ocean depths in the Navy research plan.

Acoustics, marine geology, marine biology, ocean chemistry, physical oceanography, undersea research vehicles, life support systems, deep moored and drifting buoys, remote sensing of the sea surface, advanced data handling and new environmental prediction techniques — these are some of the areas of increasing interest which should present long-term challenges to scientists and engineers.

## Similarities of Space and the Sea

**I**N LOOKING at the types and scope of problems typical of ocean research and development, we are struck by the many similarities to our space program.

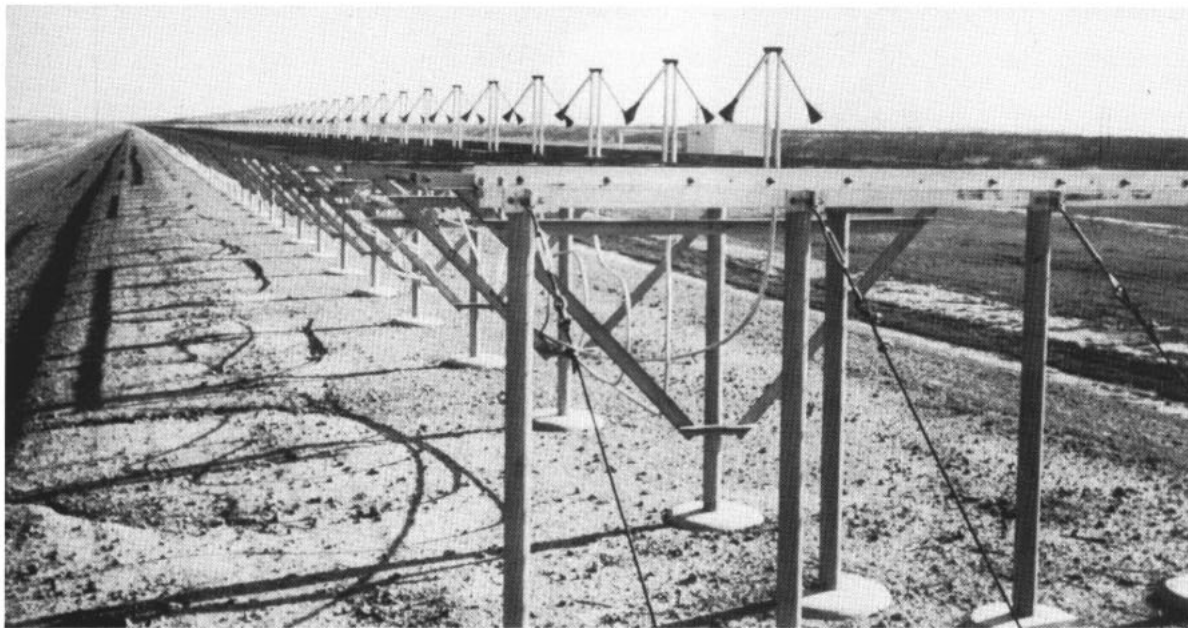
- Both the ocean and space represent research environments that bring together scientists of many disciplines who are from many different types of research organizations.

- They are both relatively unknown environments which are hostile to man, which represent extreme technological challenges in building rugged, reliable vehicles and instruments to do useful work.

- Both are on the brink of the largest survey and exploration programs which man has ever attempted. They will require data handling systems far in advance of anything man has yet conceived.

- Both will probably ultimately require very sensitive instrumentation for detecting and measuring phenomena from low acoustic frequencies to RF to light through X-rays.

Naval Space Surveillance—NAVSPASUR is a command, and the stations are part of a System. For a roundup report, see page 10 and also ALL HANDS, July 1968 issue.





• Both environments will require some large-scale, high-cost research facilities — especially vehicles — that will be used for many purposes.

Some of these similarities lie in the realm of "Big Science." The lessons we are now learning in the national space program, such as *Apollo*, may well be applied to the large ocean research projects.

However, it is more interesting to look at some of the smaller projects. It is here that we can see more clearly the intimate mutual support of research in space and the sea.

**P**ROJECT TEKITE I—This is an ocean bottom study which involved the longest continuous undersea stay of a diving team yet attempted. The project's name was inspired by the combination of apparently divergent factors — space and ocean.

Tektites are small mineral objects found both on land and in the ocean that have survived a flaming passage through the earth's atmosphere from space.

The program had two objectives: Experimentation and study in several marine sciences on the ocean bottom; and observation and analysis of the behavior of man in an isolated, alien environment under stress. The behavioral study is applicable to both undersea missions and to extended-duration space missions.

**T**HE BARBADOS Oceanography/Meteorology Experiment — known as *Bomex*, is another joint project of interest to the Navy. In this, environmental data was collected over a limited ocean area, east of Bar-

bados, to study the joint behavior and interaction of the atmospheric and ocean system in subtropical and tropical waters.

Environmental sensing platforms included moored buoys, surface ships, aircraft, and satellites of opportunity. The problems of predicting underseas patterns in temperature, pressure, turbulence, current flow and salinity are, of course, of great importance.

The obvious relations with acoustic detection systems and underseas weapons design makes this an area of great interest to the Navy in ASW, in submarine warfare and mine warfare capabilities.

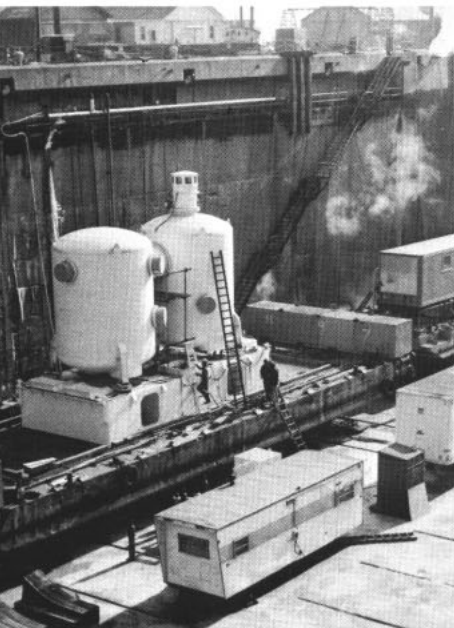
**S**PACECRAFT OCEANOGRAPHY PROJECT — Established in 1965, this project is supported by NASA as the ocean portion of its Earth Resources Survey Program. At present, the program is concentrating on the design, testing and ultimate space qualifications of satellite sensors for remote measurement of oceanographic factors such as sea state, sea surface temperature and ice conditions.

Both manned and unmanned satellites using radar, visible optical systems, infrared and microwave spectrometers and radiometers are used. While university investigators predominate, the radio astronomy group at NRL has been asked to investigate the possibility of using microwave radiometry to survey the ocean.

#### Miscellaneous General Support Projects

**N**AVIGATION — The Navy Navigation Satellite System, formerly known as *Transit*, was first orbited

TEKITE I undergoes systems tests at drydock in the Philadelphia Naval Shipyard before being anchored to sea floor by Navy Seabees. Right: artist's conception.





# SPACE and the SEA

in 1960 and used operationally in 1964. The technology and system facilities for this project have also contributed to a joint DOD program in satellite geodesy.

In 1967, the design information of the shipboard navigation equipment for this system was made available to U. S. industry on an unclassified basis.

The importance of the satellite receivers for unclassified research can be most dramatically demonstrated by a description of the year-long scientific exploration of the oceanographic ship *Argo*. This 61,000-mile voyage in the Pacific, Indian and Atlantic oceans combined a seagoing computer with the satellite navigation equipment and was able to record simultaneously research data and the precise location of the ship in all weather conditions.

**S**ATELLITE/BUOY COMMUNICATIONS — a project now underway will participate in NASA programs in satellite interrogation, data relay and position fixing of various platforms used to make environmental measurements.

The experiment will investigate the effects caused by the variation of several factors; coding techniques, satellite orbits, position-fixing schemes, frequencies, and buoy electronic packages. Basic design data, peculiar to the ocean buoy environment and applicable to many Navy problems (such as ASW), should be acquired at a reasonable cost because of the utilization of existing NASA facilities.

**S**OLRAD—NRL's Space Sciences Division, supported by the Naval Air Systems Command, has conducted a series of solar X-ray and ultraviolet measurements by satellite since 1960. The 1960 satellite *Solrad* was the world's first successful astronomical observatory satellite. Readout of the most recent satellite, *Solrad IX*, launched on 5 Mar 1968, is being conducted by

"Both the ocean and space are on brink of the largest survey and exploration programs that man has ever attempted . . ."



NASA, ESSA, and the international scientific community.

While the major military application is considered to be a monitoring and warning device for communication disruption and radiation hazards to astronauts, its accumulation of isolation data for atmospheric and ocean environmental studies is an obvious and important by-product.

**E**SSA WEATHER SATELLITE — A joint research and development program in weather satellites by ESSA and NASA has resulted in the Environmental Survey Satellite (ESSA) operational system.

The Navy's interest in the products of this program has led it to develop shipboard versions of the Automatic Picture Transmission terminals. Such terminals have provided two- to four-mile resolution pictures for cloud coverage at distances out to 2500 miles from the ship. This information is extremely valuable in supporting tactical Fleet operations, particularly with respect to short-range weather forecasts. Navy participation in satellite communications programs is of a similar nature.

**T**HE INSTANCES CITED above represent only a few of the many projects which represent a link between our research environments of space and the sea.

There are many other examples wherein a technique, instrument or capability, developed in one environment, has equally meaningful applications in the other:

- The use of acoustic wave theory to study the atmosphere;
- The possible use of radio astronomy radiometric techniques for an all-weather radio sextant for ocean navigation;
- Remote underwater manipulators that have their counterparts for planetary exploration;
- Advanced energy conversion techniques that require long-lived, unattended operation in both space and the oceans.

To us in the Navy, it is interesting to watch a cycle which started almost 140 years ago beginning to complete its first swing.

What started as a small Depot for Charts and Instruments in 1830 with a mission to provide for safe navigation of the Navy's ships at sea, has turned to a study of the oceans and the celestial bodies to help solve its problems.

As we look ahead to the challenge of national security in the 1970s and '80s, the Navy research community sees many complex missions. Certainly, highly advanced sea-based weapons systems will be a part of our national strategy and military posture.

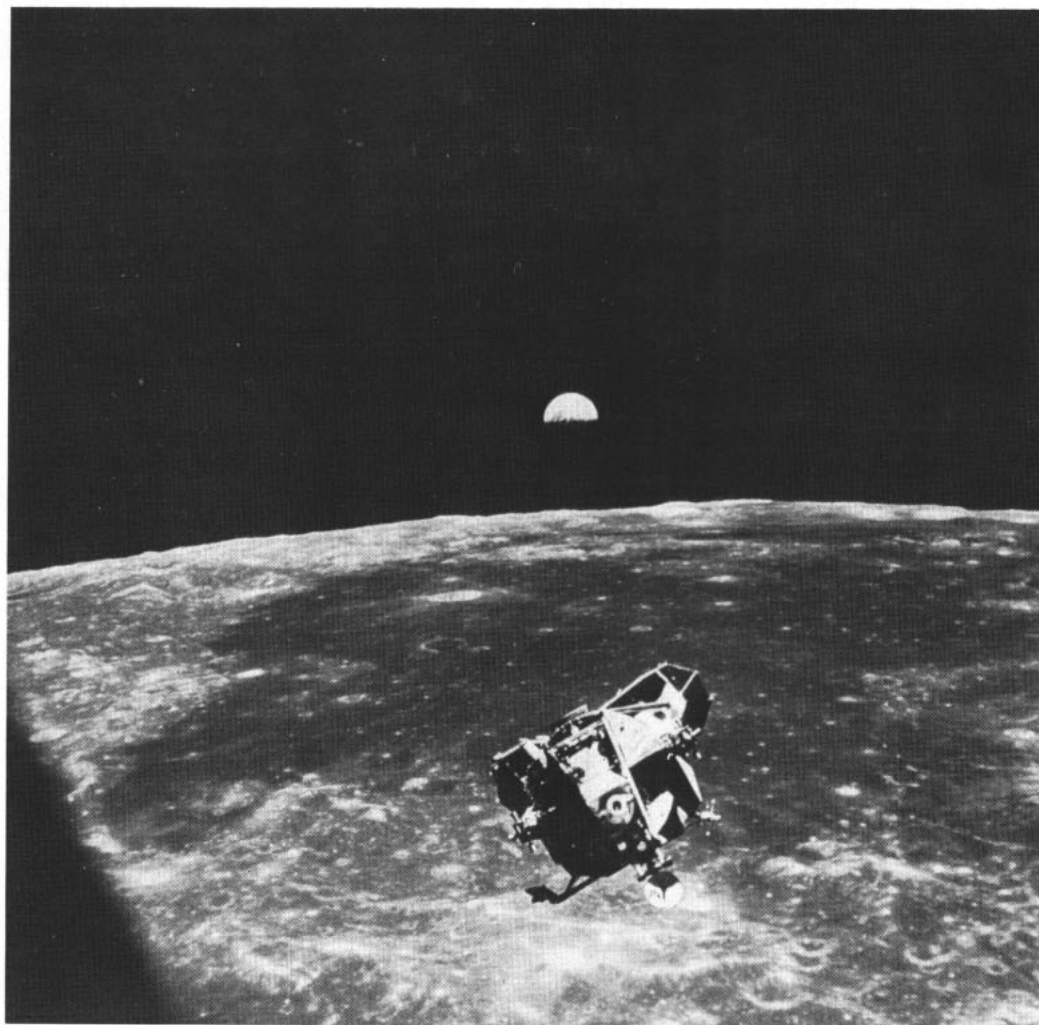
Leading the way for such systems, the Navy research community sees a research horizon that begins to blend once again into a joint program of space and the sea.



**chapter II**  
**DAWN of a NEW AGE**







Apollo 11 LEM approaches Command Module after leaving moon. Earth rises above lunar horizon.



# NAVY'S CONTRIBUTION TO THE SPACE EFFORT

# GIANT Leap For



The Navy contributed much to man's "great leap" to the moon.

# Man Kind

*The magnificent achievement of the landing on the moon, not once but on two separate occasions, is a demonstration of teamwork accomplishing the near impossible. Teamwork has been the keystone of the accomplishment in the United States space program.*

*The space effort is the basic responsibility of the National Aeronautics and Space Administration, but the Department of Defense and the armed forces team have worked closely with NASA to lend their knowledge and experience in support of America's space effort. Navy's role in the modern space program dates back to the early 1950s and continues today in the scientific work of numerous agencies that are a part of the naval establishment.*

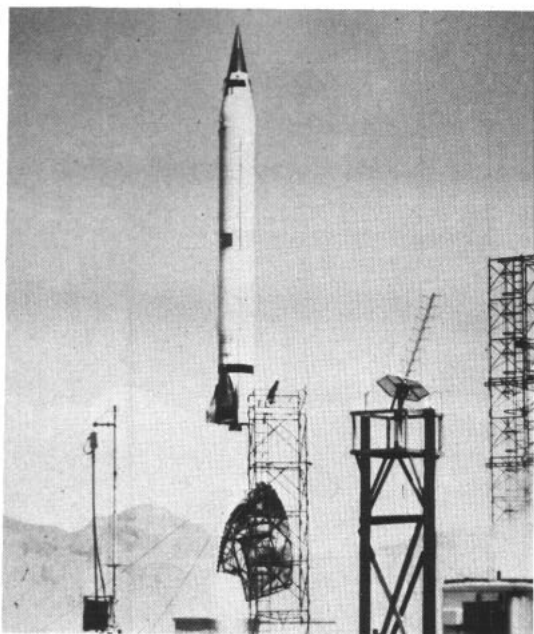
*The lead articles that appear here were prepared by Journalist 2nd Class Milt Harris and Journalist 3rd Class J. R. Kimmins, and released by the Office of the Navy's Chief of Information.*

*The report on the Apollo 12 mission is the work of Chief Journalist Marc Whetstone, USN.*

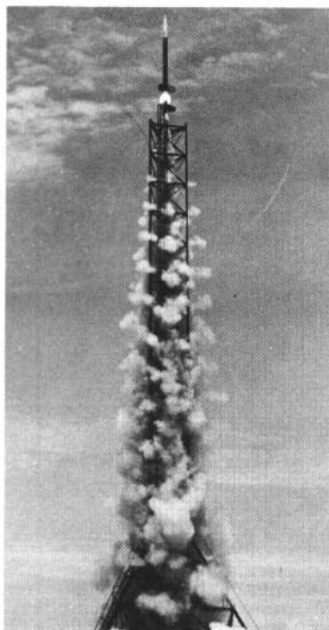
*A report in the January issue of ALL HANDS Magazine, page 2, gave, in part, the contributions of the Naval Ordnance Laboratory in the space effort.*

*Here is a roundup highlighting the Navy's role in support of the space effort, with emphasis on those programs not as well known as the moon landings.*

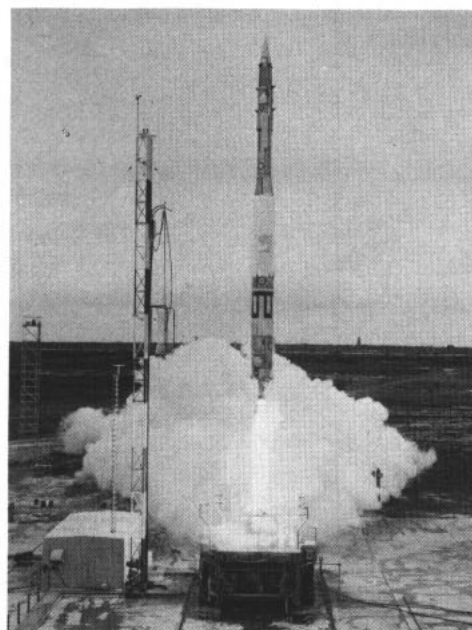




This Viking II rocket reached a record height of 158 miles and hit 4300 mph in test in 1954.



Aerobee Hi soared to new record of 163 miles in mid-1956.



An early test of the Vanguard system is fired at Cape Canaveral in 1957.

**T**O START OFF, here are some highlights of Navy contributions to the space program:

- Twenty-three of the 32 military astronauts today were commissioned as military officers from Navy sources.

- Seventeen of the 32 astronauts are naval aviators. (Pilots entering the Navy's flight training program, from the Marine Corps and the Coast Guard as well as Navy sources, are designated naval aviators upon completion of the training.)

- First U. S. man in space — naval aviator — CAPT Alan Shepard, USN.

- First U. S. man in orbit — naval aviator — COL John Glenn, USMC.

- First man on moon — former naval aviator — Neil Armstrong.

- First All-Navy crew to land on the moon — CAPT Charles Conrad, Jr. and CAPT Alan L. Bean, with CAPT Richard F. Gordon manning the command space ship during the moon walk.

- All recoveries of manned capsules have been made at sea by Navy ships.

- Original flotation collars for capsules were Navy-designed.

- Navy's development of the full pressure space suit was a stepping-stone on the way to manned space flight.

- Navy trained Monkey Baker — one of two animals first to survive a space flight. Monkey Baker (a lady) is still living and resides at the U. S. Naval Aerospace Medical Institute in Pensacola, Fla.

- Navy's experiments with balloons began shortly after World War II to provide better understanding of problems to be solved before manned space flights. This led to Project *Stratolab* — a series of

balloon ascents, one of which carried two men and scientific instruments to an altitude of 86,000 feet. One of the *Stratolab* flights gave conclusive proof that the atmosphere of the planet Venus contains water vapor.

- Beginning in March 1958, three Navy *Vanguard* satellites were placed in orbit. *Vanguard* was responsible for a more accurate determination of the shape of the earth.

- Environmental studies gathered from submarines (especially nuclear subs) where adequate supply of oxygen, shielding from radiation and an effective environment for men to work for long periods of time were common to both submarine and space.

- Significant Navy Launchings/Projects: *Viking*, *Aerobee*, *Rockoon*, *Argus*, *Polaris* and Transit Navigational Satellites.

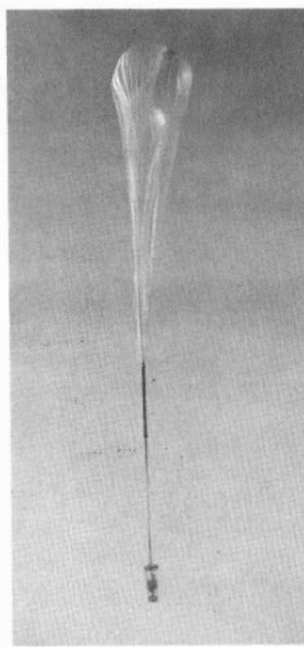
## The NAVSPASUR Story

**O**N 4 Oct 1957, the Soviet Union succeeded in man's first attempt to reach beyond his terrestrial home. The space race was on, as the historic launch of *Sputnik I* became a temporary symbol of Soviet superiority. Today, the successes of the Apollo manned missions have put the United States in the forefront of space activity.

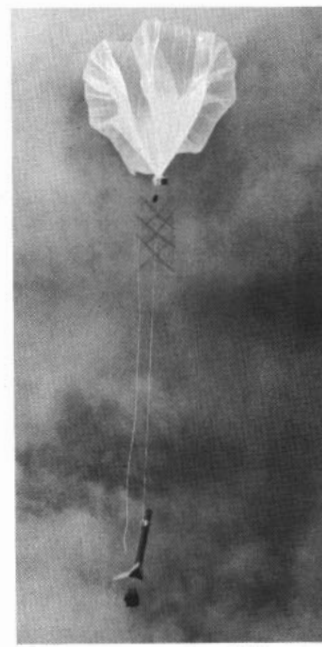
Although men of the United States Navy are playing primary roles in today's Apollo missions the Navy has a long history in space predating the Apollo missions. It was a Navy effort that launched one of America's first satellites, *Vanguard I*. The *Vanguard* program is now history, but it developed another of the Navy's most important, yet little known, space re-



Two Navy observers set altitude record of 76,000 feet in balloon-carried Stratolab gondola in 1956 ONR project.



Unmanned Stratoscope project took pictures of sun in 1957.



Rockoon gathered data on solar radiation.

lated activities, the Naval Space Surveillance System.

The Navy first entered the field of space surveillance through a combination of crisis and coincidence. At the time of the Soviet Union's initial space orbit, the United States could detect and track only those foreign, possibly hostile, satellites which broadcast a continuous signal on a known frequency. The country had no capability to detect a so-called "quiet" satellite, one which broadcast no such continuous signal. Such quiet space vehicles could have been launched clandestinely by foreign powers, and posed a threat to United States security.

To meet this threat, the Joint Chiefs of Staff directed the Advanced Research Projects Agency (ARPA), of the Department of Defense to develop a detection and tracking system for quiet satellites as rapidly as possible.

The United States Navy, utilizing existing equipment and techniques developed as part of the *Vanguard* program, was able to present ARPA with plans for a system which could be operational in less than a year. With time the critical factor, the Navy team provided rapid response to a vital national need.

**W**ITHIN EIGHT MONTHS of an ARPA go-ahead directive, the Naval Research Laboratory installed the first units of what today has become the Naval Space Surveillance System. Since the early deployment of these first components, NAVSPASUR has enlarged, modified, and used the increasing technology of space sciences to develop a system capable of detecting and developing orbits on objects in space to altitudes of thousands of miles.

Operationally, NAVSPASUR is under the control of the Commander in Chief, North American Air De-

fense Command, and provides operational support as directed to the Chief of Naval Operations. In April 1961, NAVSPASUR became an integral part of the NORAD Space Detecting and Tracking (SPADATS) system, a network of sensors which keeps track of all foreign and domestic space activity. NAVSPASUR responds to both Navy and NORAD requirements.

**L**OCATED in an unpretentious brick building at the Naval Weapons Laboratory, NAVSPASUR Headquarters in Dahlgren, Va., is the nerve center of a system that stretches across the United States. Headquarters houses administrative offices, a Command Center, various support offices, and a computational complex consisting of two IBM 7090/30 and one IBM 360/30 computers.

The Dahlgren Command Center controls six receiving stations and three transmitting stations along 33° north latitude across the southern United States. Each of the receiving stations is connected directly with Dahlgren by data lines, and a teletype network links all field activities.

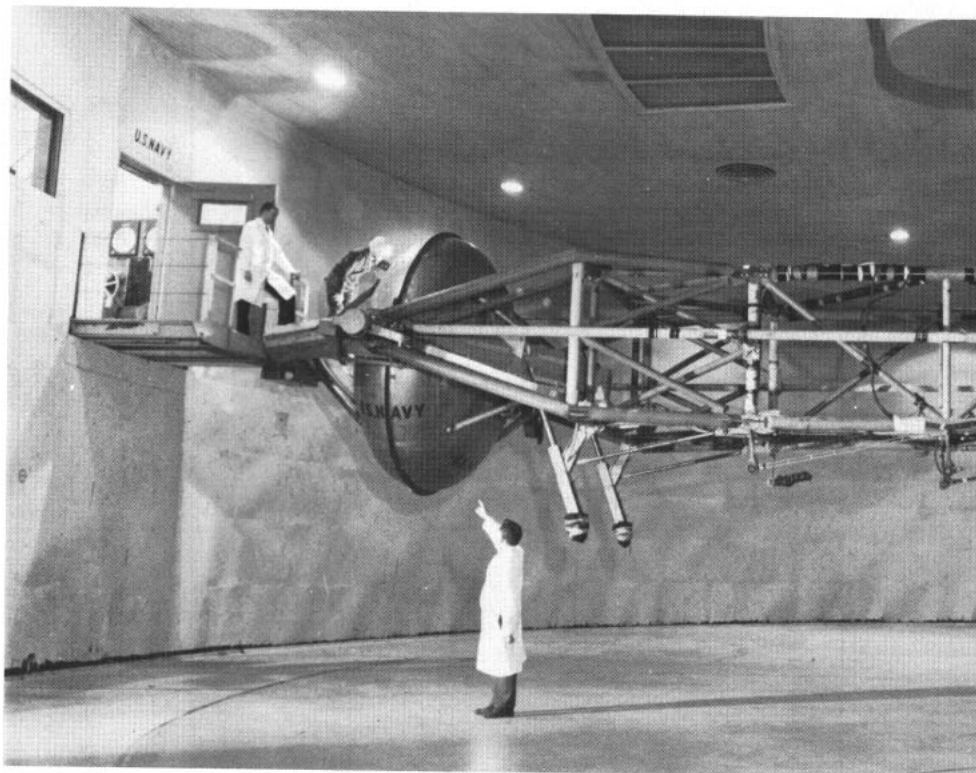
The three transmitting stations at Jordan Lake, Ala., Lake Kickapoo, Tex., and Gila River, Ariz., emit a continuous fan of carrier-wave energy on a frequency of 219.98 of Mhz. This fan, commonly called the "Fense," is produced by 50,000-watt transmitters at Jordan Lake and Gila River, and by the main one-million watt transmitter complex at Lake Kickapoo.

**W**HEN A SATELLITE passes through the NAVSPASUR Fense, some of the energy hitting it is reflected back to one or more of the six receiver stations located at Fort Stewart, Ga., Hawkinsville, Ga., Silver Lake, Miss., Red River, Ark., Elephant Butte, N. Mex., and





High-altitude pressure suit of 1956 led to spacesuits.



Centrifuge at Naval Air Development Center simulated stresses of flight in the upper atmosphere and space for Navy fliers and astronauts.

San Diego, Calif. Each of these stations is equipped with special filters that adjust the site antennae to the changes in frequency of the reflected signal caused by the phenomenon of Doppler shift.

The NAVSPASUR system uses the interferometer method of determining azimuth and zenith angles to position a satellite in space as it appears in the Fense. The receiver stations provide the Dahlgren Headquarters with the raw data necessary by measuring the differences in phase reading of the reflected signal as received by different parts of antennae.

This ability to measure precisely these minute variations in signal permits the system to generate the zenith angles required to position the satellite to an accuracy of one one-hundredth of a degree. To obtain the required raw data, two types of receiver stations are used. Elephant Butte and Hawkinsville are "high-altitude" stations and the remainder are "low-altitude" facilities. The basic difference is the increased antenna length at the high altitude stations permitting greater sensitivity, and thus, reception of signals from farther in space.

At Headquarters, the raw signal, consisting of the measured differences in electrical phase, goes through two integrated steps to produce positional data on the satellite creating the signal. The ADDAS, or Automatic Digital Data Assembly System, is a specialized computer which converts the raw signal from analog to digital form, filters out noise and signals created by airplanes, and further prepares the raw data for the second step: entry into the 7090 computers.

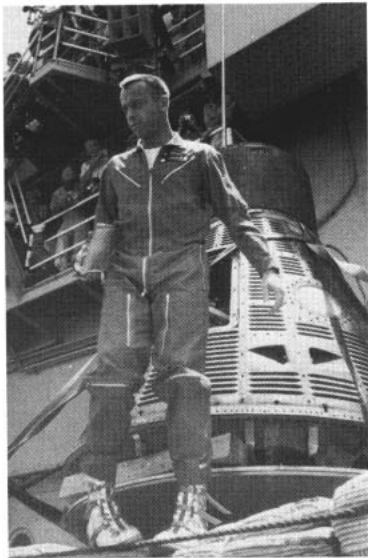
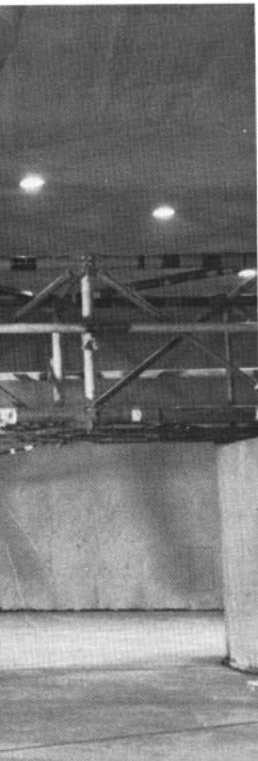
In the 7090s, the measured phase differences are used to compute the actual position of the satellite. This positional data is compared against predictions of positional data on all known satellites which pass through the Fense. When a signal matches one predicted for a known satellite, it can be identified by the system.

If a signal is received that has not been predicted, it is categorized as an "unknown" and special analysis procedures are initiated. Most unknowns can be identified quickly as old satellites whose orbits have changed as they decay. On all objects which cannot be readily identified, NORAD is notified by high-speed communication facilities.

ONE OF THE system's 7090 computers implements NAVSPASUR's "closed system," a constant update of the basic data base which permits NAVSPASUR to operate with complete independence from any outside source. When a satellite is observed, it is identified according to predictions based on the unique characteristics of its orbit, called elements. The elements of a particular satellite are derived from observations made by NAVSPASUR's receiving stations.

From the elements, in turn, predictions on when and where to expect new observations are made. These further observations on a satellite are used to update the elements, providing more exact predictions of future observations. The cycle continues in a constant process.

This closed system makes NAVSPASUR unique among



**CAPT Alan B. Shepard Jr.,**  
first American in space.



**All-Navy crew of Apollo 12 receives congratulations from the President after moon mission. L-R: CAPTs Conrad, Gordon, Bean.**

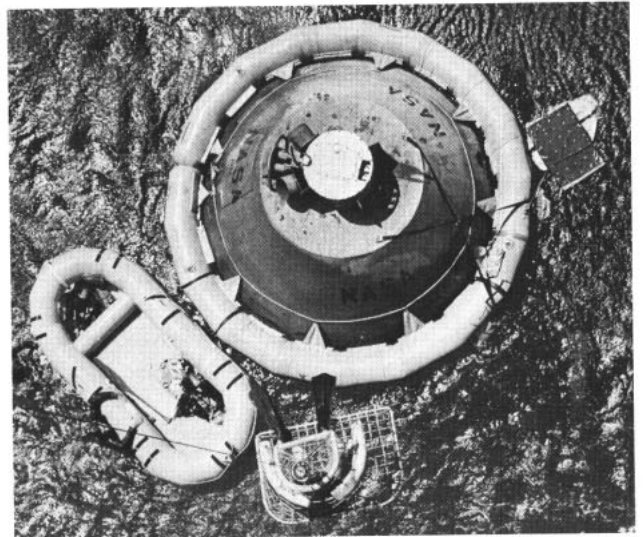
SPADATS sensors in its ability to generate high quality element data and thus provide both elements and observations. With its own computers, NAVSPASUR can act as a backup facility to the NORAD Space Defense Center.

**T**HERE HAVE BEEN over 5000 objects sent into earth orbit since the *Sputnik I*. Of these, over 1700 are still in space, including more than 350 payloads and various space debris.

NAVSPASUR presently averages 14,000 observations per day on a rapidly growing space population. Identification of a satellite, from initial reception by receiver station antennae to identification by the 7090s takes an average of two seconds. In addition, NAVSPASUR's present facilities are capable of handling the increasing space population for years to come.

The system's independence, element generation capability, and reserve capacity, coupled with its high accuracy and reliability rate, make the Naval Space Surveillance System a vital and unique link in the NORAD Space Detection and Tracking System that guards the United States 24 hours a day, seven days a week.

*On the following pages are a series of brief summaries of certain Navy scientific and operational contributions to the space effort. They do not completely cover the Navy's efforts in this field, but serve to highlight the team effort with NASA and the other branches of the armed forces.*



**UDT swimmers practice recovery operations with Apollo 11 spacecraft mockup. Recovery net (bottom) dangles from helo.**



## From VANGUARD To

# SOLRAD

**S**HORT-TERM solar flare activity forecasts, derived from information furnished by the Naval Research Laboratory's SOLRAD-9 (Solar Radiation) satellite during America's historic moon landing, played a significant role in safeguarding the spacemen and their communication systems in *Apollo 11*.

Naval Research scientists from the laboratory's site near Washington, D.C., said that solar radiation, which fluctuates, can be in the form of intense proton streams that would be harmful to spacemen out of their vehicle or could play havoc with ground communication systems.

SOLRAD-9, the 9th in a series of solar radiation detection satellites, senses solar x-ray emissions, records them and, upon command, telemeters the data to a receiving station at the lab's Blossom Point, Md., site. SOLRAD satellites are sponsored by the Naval Air Systems Command and are put into orbit by the National Aeronautics and Space Administration.

**S**PECIAL OPERATIONS for the *Apollo 8* moon mission by the SOLRAD Satellite data system began at the request of NASA officials in December 1968, when spacemen first circled the moon and returned to earth.

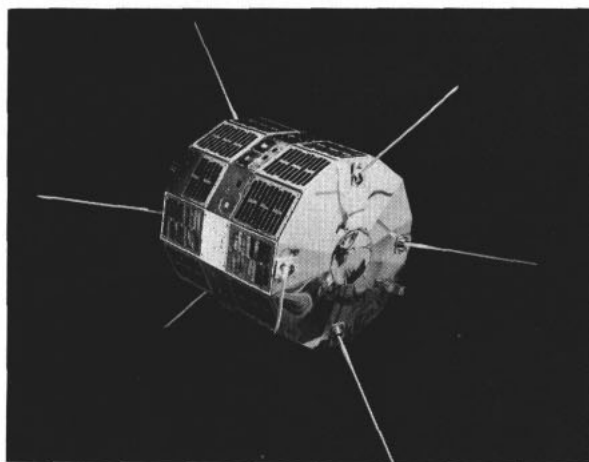
During this period the satellite stored a continuous record of solar x-ray activity. It queried also for radiation data as often as six times during a day when it was in view of the Blossom Point receiving station.

The stored data was processed in about a half an hour's time at the Naval Research Laboratory and then transmitted by facsimile to the Environmental Science Services Administration's Space Disturbance

Forecast Center at Boulder, Colo., where it was used to assist in the evaluation of the space environment.

SOLRAD Project support was also given during the flight of *Apollo 10* in May 1969. Scientists ascertained that the radiation levels that existed during the *Apollo 8* and *9* missions were not hazardous.

**A**S A SAFETY MEASURE, the Project support was used again at a request of NASA officials during the *Apollo 11* mission to provide solar activity data



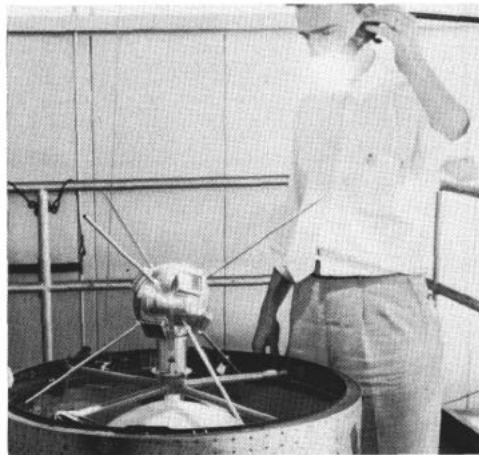
Navy-sponsored SOLRAD-9 helped to safeguard spacemen.

to the Space Disturbance Forecast Center. The record low level of solar x-ray activity measured during the mission proved that the astronauts were operating

Navymen view model at Vanguard Computing Center in 1957.



Satellite's solar batteries undergo light test in 1957.



in optimum radiation environment and at no time were in any danger from the solar radiation.

The data resulting from the Naval Research Laboratory's SOLRAD Satellite system was considered by mission officials to be timely and accurate. Timeliness was significant because very intense solar radiation could result in the cancellation of certain phases of the lunar mission.

**T**HE FIRST of a series of nine SOLRAD satellites was conceived and developed by the Naval Research Laboratory and launched in 1960. In the years prior to the two-month successful results of SOLRAD I, scientists used rockets to lift x-ray sensors above the

earth's atmosphere. These were the first detectors to confirm experimentally that the sun emits x-rays.

SOLRAD 9, which was launched 5 Mar 1968, weighs 195 pounds and is in the shape of a 12-sided drum. It is about 30 inches high and 30 inches across. After a year and a half of continuous operations the satellite is still transmitting measurements of the time history of solar x-ray emissions.

The Naval Research Laboratory stands today as one of the foremost physical research laboratories in the world. In all of its major fields of research — electronics, materials, general sciences and oceanology — the effort is directed toward new and improved equipment techniques and systems for the Navy.

## NAVAL OBSERVATORY'S ATOMIC CLOCK

**T**HE NEXT TIME you look at your watch, think about the scientists at the U. S. Naval Observatory, Washington, D. C. Their business involves keeping up with what time it is also, but they worry about where we are, in time, to millionths of a second.

Using cesium beam atomic clocks, Observatory scientists determine standard time for the Department of Defense. Correct time intervals are broadcast by the Observatory to various stations in the U. S. that, in turn, forward it to ships at sea, aircraft, both military and civilian, and to other governmental institutions like the Coast Guard, the Federal Aviation Administration, and the National Aeronautics and Space Administration.

NASA uses the Observatory time to launch its vehicles, control them in space, and bring them home again, all of it done to the closest precision time available through modern "time technology."

**T**IME WAS FIRST determined by the Navy Department in 1830 to meet the needs of navigation. These needs still exist, but in addition, requirements for accurate time of the highest precision for scientific and technical purposes have expanded considerably.

The increasing need for precise time measurement has been met with increasing precision of the clocks used by the Observatory. The Master Clock, used by the Observatory as the ultimate authority, is really a series of 15 especially selected cesium beam atomic clocks, whose time pulses are averaged together.

This average varies only by a tiny amount, perhaps five-millionths of a second in a year, and is used to determine the correct time in all other installations.

Anyone can use the facilities of the Naval Observatory. Correct time signals are broadcast on the short-wave band at 2½, 5, 10, 15, and 20 Megahertz frequencies. This station, known as WWV of the National Bureau of Standards in Fort Collins, Col., can be picked up on any shortwave radio.

**T**O BE ABLE to determine the correct time in Washington, D. C., is meaningless unless you have a means of transmitting this pulse to other stations, said Dr. Gernot Winkler, director of the Observatory's Time Service Division.

Therefore, the Observatory is investigating more precise methods of sending time signals. Experiments are in progress, he said, that eliminate the interference caused by the atmosphere, the earth's gravity, or any other natural phenomena.

The Observatory's atomic clocks work on the principle of the production of a stable frequency by an atomic transition. This frequency is constantly checked, monitored, amplified, and converted into the standard measurement of time we use—the second.

"Today, these cesium beam clocks," said Dr. Winkler, "operate with a precision and accuracy of

Naval Observatory employee points to visual display of atomic clock used to calibrate other timekeeping devices.





about one part in one trillion, or less than one-tenth of a micro-second (millionth of a second) per day."

#### Observatory Star Charts

**O**N LAND, you can go only in two directions, left or right and forward or back. In space, distance—or an extra dimension—needs to be calculated. The stars provide the key to this measurement.

Astronomers at the U. S. Naval Observatory in Washington, D. C., were asked by the National Aeronautics and Space Administration to develop a series of "star charts" for use by *Apollo* astronauts in navigation and visual orientation.

Using the Observatory's computer and the *Nautical Almanac*, Observatory personnel developed the charts that have been used in each manned space flight since *Apollo* 8. The *Almanac* shows the position of observable stars for a calendar year.

Developed primarily by Dr. Raynor L. Duncombe, director of the Nautical Almanac Office of the Observatory, the star charts have to be revised for each space flight. The universe is always in motion and the relative positions of the planets and stars to each other are forever changing.

Two different sets of star charts were developed by

the Observatory for use by the astronauts, one giving the relative positions of the stars as one would see them aligned along the equator of the moon, and one set giving the relative positions as aligned with the ecliptic or plane of the earth's orbit.

**F**ROM DISCUSSIONS with the astronauts, Dr. Duncombe found that the ecliptic star chart, the one aligned with the earth's orbit, was more useful as a navigation and orientation guide.

Data for the star charts were extracted from the annual *Observatory Almanac*.

"Accuracy is the byword among astronomers," said Dr. Duncombe. "Going to the moon is one thing, it is only 240,000 or so miles away.

"But going to the planets is a far different story. We've got to know the X, Y, and Z positions of the planets far more accurately than we do now if we are to land a man at some point in space with any measure of accuracy."

When interplanetary travel becomes a reality, the Naval Observatory will have a hand in the development of navigation aids for future pilots. Until then, the Observatory and those who work there are happy to share in the success of future *Apollo* exploits.

## Navy's ARF is a Drag

**W**HEN WE THINK of space travel, we think of fantastic speeds and altitudes. *Apollo* capsules are traveling at 20,000 miles an hour when they reach the earth's atmosphere on reentry. Developing a system to slow down the capsule to a speed that would survive a watery landing fell to the Navy's Aerospace Recovery Facility (ARF) in El Centro, Calif.

The *Apollo* Earth Landing System was developed, tested, and qualified for the National Aeronautics and Space Administration over a six-and-one-half-year period from June 1962 to January 1969.

Responsibility for the system was delegated to the Navy by NASA to include over-all responsibility for

contractor performance, with emphasis placed on quality and configuration of the product, the system, and the component reliability.

**T**HE NAVY facility supported the development of the system with two units, the Industrial Shops and the Photographic Division.

The ARF Industrial Shops supported all phases of the *Apollo* Capsule Recovery System, including fabrication of a Parachute Test Vehicle which was used to test the hardware, risers, extraction system, attaching methods and parachute systems for the *Apollo* capsule.

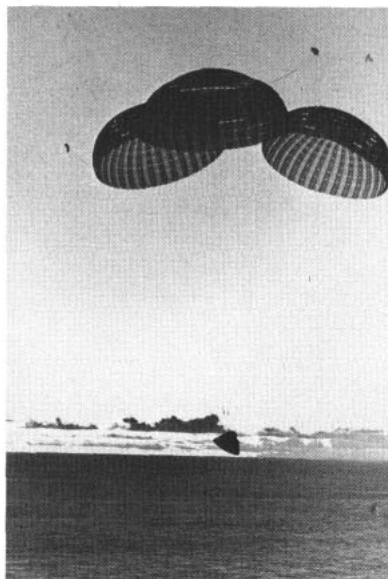
The Parachute Test Vehicle was constructed from deactivated Navy P-10 bombs to cut costs of materials and bring the vehicle up to the approximate weight of the actual capsule.

**T**HE INDUSTRIAL Shops also supported contractors on manufacture of a full-scale mockup working model of the Lunar Landing Module. This mockup was for design, development, and testing of a suitable method of absorbing landing shock on the moon.

The ARF Photographic Department took and processed 60,000 still pictures and 1.5 million feet of motion picture film for use by analysts to check effectiveness of the recovery system. The photographic support used both black-and-white and color film.

The Aerospace Recovery Facility completed a total of 161 earth/water tests in the Salton Sea and on the desert landing test range to fulfill the requirement for the careful science of bringing the moonmen back home.

**Apollo 10** nears end of mission with splashdown in the Pacific.



# SATELLITE COMMUNICATIONS

**F**ROM HIS OFFICE on the fifth floor of the Pentagon, Navy Captain Samuel L. Gravely looks out onto a brick wall. He has no view. CAPT Gravely's concern is not with earth-bound objects for he is the Navy's Program Coordinator for Satellite Communications.

Working in the highly complex field of electronic communications, CAPT Gravely coordinates the



**CAPT Samuel Gravely makes plans for Navy use of satellites for communications.**

Navy's plan for utilization of the Defense Satellite Communication System (DSCS) and the Tactical Satellite Communication System (TACSATCOM). In the latter satellite program, he is the Navy member

of the triservice group who manage the development phase of the TACSATCOM program.

"The advent of satellite communications promises to completely revamp Naval communications," said CAPT Gravely. "Satellites will provide the Navy with a communication capability which is highly reliable, instantaneous, and worldwide.

"It is the only communication medium which will not be hampered by atmospheric conditions, long distances, or geographic location of the user. All other communication systems are plagued with one or all of these problems."

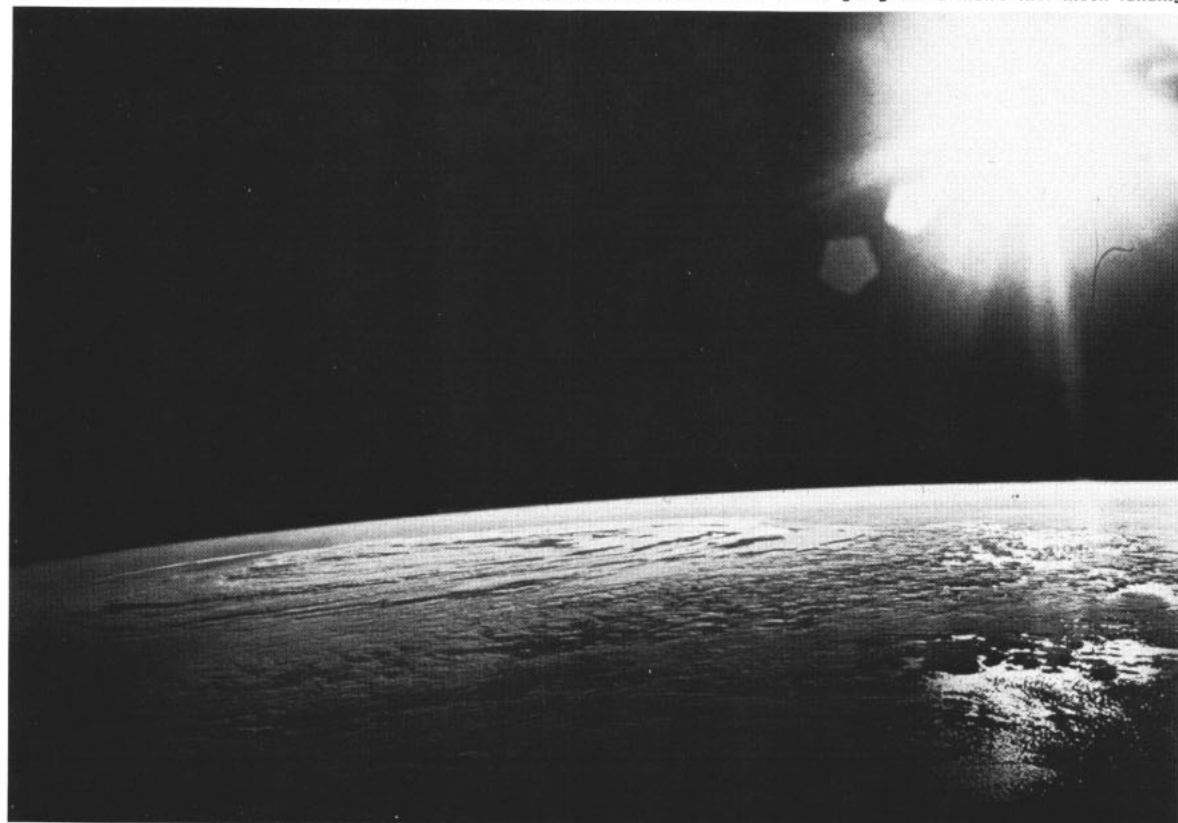
**B**OTH DSCS and TACSATCOM satellites were used by the National Aeronautics and Space Agency in recovery operations. "These are national assets and not solely Navy assets," he cautioned.

In recovery of *Apollo 11*, he explained, the TACSAT I satellite was used to relay voice transmissions from the recovery area to the Manned Spacecraft Center in Houston.

"TACSAT I and DSCS terminal equipment were also used to relay commercial television coverage of the moon walk and the recovery of the astronauts to Alaska," he said.

CAPT Gravely came to Satellite Communications after completing command of *uss Taussig* (DD 746). Before that he was commanding officer of the radar picket destroyer *Falgout* (DER 324) based at Pearl

Sun flare in camera lens brightens the dark sky as *Apollo 11* orbits the earth before going on to man's first moon landing.



Harbor, Hawaii. *Falgout* patrolled the Pacific Early Warning Barrier.

He also served aboard *uss Iowa* (BB 61), *Toledo* (CA 133), *Seminole* (AKA 104) and *Theodore E. Chandler* (DD 717) in addition to commanding *Falgout* and *Taussig*.

CAPT Gravely started his 27 years of naval service as an enlisted man. He was commissioned as ensign in the Naval Reserve in 1944 after graduation from the Midshipman School at Columbia University, New York City.

**H**IS PRESENT JOB was created in 1965 as a central coordinating point for all Navy efforts in satellite communications.

"As a result of advancing technology and greater Navy participation in this area," explained CAPT Gravely, "the office has significantly expanded into a major division within the Office of the Assistant Chief of Naval Operations for Communications."

Full use of the capabilities of satellite communication systems lies in the development of a shipborne

terminal for the equipment. Since the available satellites now in orbit can provide worldwide communication, shipborne equipment to use the satellites would enable every ship in the U.S. Fleet to contact instantly any other ship or shore station, regardless of the weather, sea conditions, or geographic location.

"Only four satellites are planned to be utilized in each system to provide global coverage," said CAPT Gravely, "except for the polar regions. Each of these satellites would be in orbit 22,300 miles from the earth and stay over the same spot on earth as it orbits." The orbit is then called a "synchronous."

The Navy was a pioneer in the use of space for communication through its Communication Moon Relay in the early 60s. In the Relay, the signal was simply bounced off the moon, without any retransmission or modification of the signal on the moon.

"All the communication satellites now being used and those under development are 'active' in the sense that they retransmit the signal received from the ground terminal," added CAPT Gravely. "The moon would be an example of a 'passive satellite.'"

## MANNED SPACE RECOVERY FORCE

**T**WENTY-FOUR hours before the splashdown of *Apollo 12* ships and aircraft of the Navy's Manned Spacecraft Recovery Forces got into action to recover the 11,000-pound spacecraft.

The Navy Manned Space Recovery Forces consist of two major task forces. They are Task Force (TF) 140, the Atlantic Recovery Force, and Task Force (TF) 130, the Pacific Recovery Force.

For *Apollo* missions, ships and aircraft of these task forces are positioned across the world's oceans before the flight and remain on station for the duration of *Apollo*. Their mission is to safely recover astronauts and their spacecraft.

The task forces, under the control of the Atlantic Recovery Control Center (RCCA) in Norfolk, Va., and the Pacific Recovery Control Center (RCCP) in Kunai, Hawaii, are both equipped to handle the re-

covery of astronauts and their vehicles during any phase of an *Apollo* mission.

However, the RCCA is primarily concerned with launch and abort missions, while its sister command, the RCCP deals mainly with the splashdown.

**T**HE RESPONSIBILITIES of the RCCA were designated for the launch and abort missions because all *Apollo* missions are launched in an eastward direction from the United States and the most probable period of a space vehicle malfunction could occur off the coast of Cape Kennedy.

For this reason, an Atlantic Ocean abort area for the RCCA has been established to cover more than 3300 nautical miles of the ocean. The Atlantic Command area extends from the eastern seaboard of the United States to the 90 degrees east longitude of the

USS Wasp (CVS 18) approaches Gemini 12 for pickup after 1966 two-man space flight.



Apollo 12 astronauts and swimmers practice recovery before second moon-landing mission.





Indian Ocean, a sizable hunk of salt water acreage.

The recovery area which is assigned to the Pacific recovery forces for splashdown purposes extends from the 90 degrees east longitude of the Indian Ocean to the West Coast of the United States.

During *Apollo* missions, recovery ships are located along the ground track over which the spacecraft flies between liftoff and orbital insertion. The recovery ships change courses to maintain the best recovery position for the spacecraft as it continues on earth orbital flights.

**T**O KEEP ships and aircraft of the space recovery forces abreast of the *Apollo's* flight progress, three command control centers are constantly passing information to each other for evaluation and analysis. The three commands include Mission Control in Houston and the RCCA and RCCP.

Within the headquarters of RCCA and RCCP charts and status boards provide up-to-date information concerning positions, fuel, mission readiness, and weather conditions in the area of ships and aircraft of their task forces.

Other reports received in the command control centers deal with information as to the capability of ships and aircraft to remain on station for the duration of the *Apollo* mission.

The centers are also equipped with complex communications systems that enable task force commanders to maintain direct voice communications with each ship and rescue aircraft assigned to their task force.

**T**HROUGHOUT the mission, a Department of Defense representative maintains direct communication with recovery force commanders while working in concert with the mission director in Houston, who has the responsibility of making recommendations to the force commanders for action required to ensure the timely recovery of the astronauts and their spacecraft.

In addition to the ships and aircraft that play an integral part in the space program, thousands of Navy-men serve with the two task forces in an effort to ensure the safe recovery of astronauts and their spacecraft.

Among these Navy-men is a group called Under-

water Demolition Teams (UDT). Their job is to assist in the retrieval of the astronauts and spacecraft components after splashdown. When the spacecraft lands in the recovery area, helicopters from the primary recovery ships are immediately dispatched to the point of the splashdown and UDT swimmers and a flotation collar are dropped in the area of the spacecraft.

The helicopter hovers over the position while maintaining communications with the task force commander, keeping him informed of the progress in recovery operations.

**M**EANWHILE, the UDT swimmers stabilize the spacecraft and maintain voice contact with the astronauts and prepare life rafts for the spacecraft crew.

The *Apollo* mission is complete; however, the recovery forces work goes on. The recovery forces deliver the spacecraft to a point designated by NASA officials and recovery equipment is returned and repositioned in preparation for the next space mission.

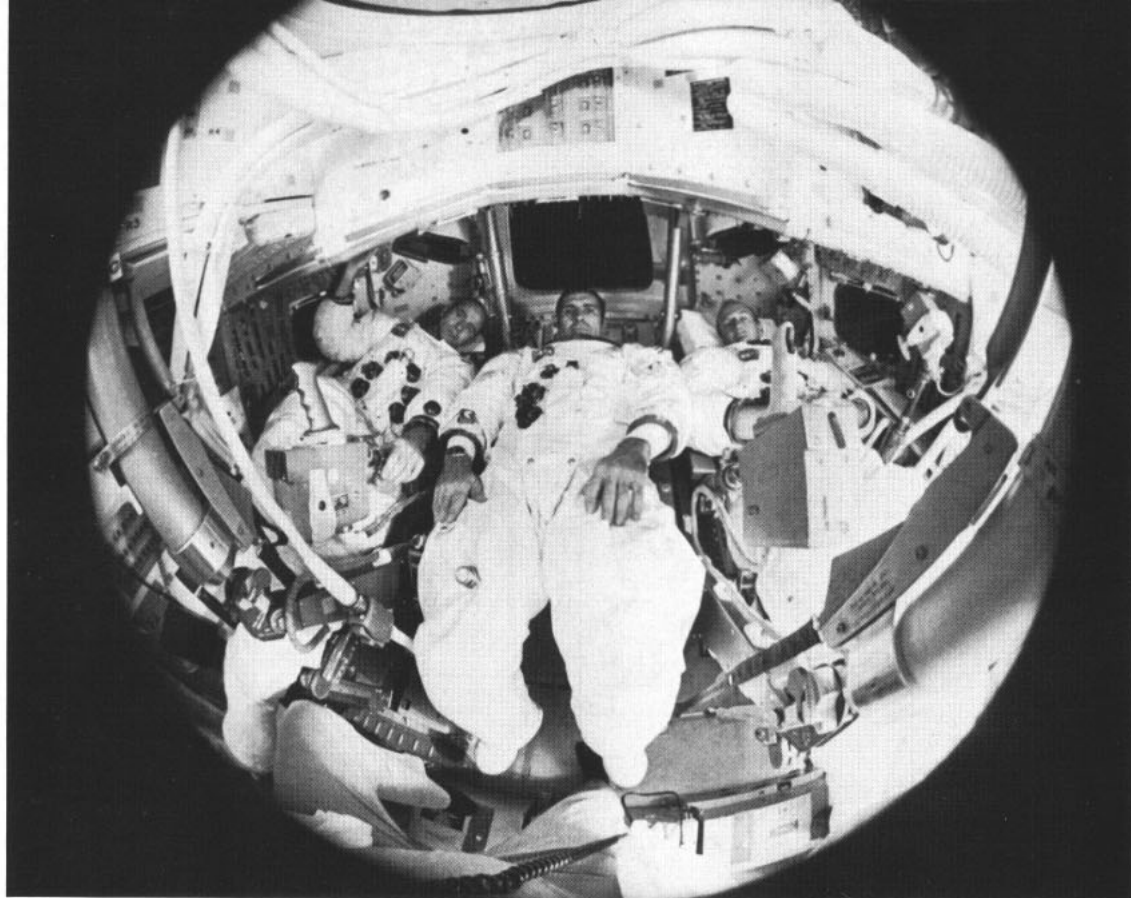
In addition, from evaluations of each *Apollo* mission, the recovery forces maintain Force training to improve readiness and precision for the next space mission.

Astronaut Buzz Aldrin poses beside U. S. flag during first moon walk. Footprints of astronauts are in foreground.



SH3D Sea King helicopters practice picking up astronauts in preparation for *Apollo 10* moon-orbiting space flight.





Fisheye view shows Apollo 12 astronauts during spacecraft checkout.

# 3 Men in a Spaceboat

**T**HE APOLLO 11 mission proved that man could make it to the moon, land, walk about its surface and safely return to earth.

*Apollo 12* proved much more.

Not only could earthlings reach the moon, they could do so and land with pinpoint accuracy, then set out on a pre-planned scientific trek and explore specific regions of the lunar surface for extended periods of time.

What's more, the accuracy of the splashdown on return to earth was nothing less than spectacular, a supreme example of precision navigation between space ship and recovery ship. *Apollo* landed within 2.5 miles of *USS Hornet* (CVS 12), its three huge, colorful parachutes clearly visible from the aircraft carrier. Splashdown was at 1558 (EST), 24 Nov 1969.

**T**HE 10-day moon flight, which began in a downpour at Cape Kennedy the morning of 14 November, was unquestionably a scientific success. It was rewarding, as well, especially for its all-Navy crew: Charles (Pete) Conrad, Jr.; Richard F. Gordon, Jr.; and Alan L. Bean. In congratulating the astronauts

by phone from the White House on being the second men to return from the surface of the moon, the President invited them to dinner and promoted each of them to the rank of captain.

The President's call was put through to the astronauts on the *Hornet*, then located 2651 miles south southwest of Honolulu, shortly after they entered the quarantine vehicle set up for them on the carrier. The spacemen had been allowed the luxury of earth's atmosphere for only as long as it took them to crawl out of their spacecraft, swing into Helicopter 66, and fly to *Hornet* to step immediately into the quarantine trailer—a period of about seven minutes.

**F**ROM THAT MOMENT, the post-flight schedule called for the three moon visitors to remain in quarantine for at least 18 days, a precaution against contaminating anyone with possible lunar disease.

Still in the trailer, the trio was taken to Pearl Harbor aboard *Hornet*. There, a dockside ceremony was held with military and civilian dignitaries present.

The astronauts, however, remained in their sealed trailer, observing the event from a window. After-

ward, the trailer was transported to Hickham air field and loaded on board a C-141 transport for the flight to Ellington air field near Houston. From there, it was transferred by truck to the Lunar Receiving Laboratory.

**I**NSIDE the quarantine vehicle with the astronauts were parts from *Surveyor 3* and large rocks in a sack which Conrad and Bean had recovered from the lunar surface near their landing site. Other specimens of lunar rock and dust, packed in vacuum-sealed containers, were relayed to Houston directly by air from Pago Pago in the South Pacific.

The treasure was contained in two air-tight boxes. The sack was filled with four extra rocks which Conrad described as "grapefruits." He explained that he didn't want to take up space in the boxes with the larger rocks so decided to sack them rather than leave them behind.

**M**AN'S QUEST for knowledge of the moon in this latest *Apollo* attempt was nearly aborted in the first few moments after liftoff. A bolt of lightning streaked toward the rising *Saturn* rocket 41.04 seconds into the flight. The lightning is believed to be the cause of an electrical failure in *Apollo 12* which created some anxious moments for both the astronauts and ground controllers, not to mention the millions of worldwide viewers.

However, the problem was quickly remedied and all systems were reported working within minutes. Recalling the incident, National Aeronautics and Space Administration Flight Operations Director Christopher C. Kraft said, "I wouldn't have been surprised right after launch if we had to come up with our first abort."

**L**IGHTNING was again a topic of discussion among the astronauts as they approached the earth's atmosphere just before splashdown.

"We can see lightning in the thunderstorms down there," reported Conrad. "I don't know how many miles out we are (it was 29,000), but all the cloud cover has thunderstorms in it. We can see lightning quite clearly flashing from where we are."

Gordon commented, saying that the flashes of lightning . . . "look just like fireflies blinking off and on."

The nearer *Apollo 12* got to earth, the astronauts reported, the lightning flashes grew brighter and brighter. "There are two areas down there that are quite active now," Conrad added. "You've got a couple of thunderstorms that are really letting go . . . about 200 or 300 miles southwest of the tip of India," he concluded.

**B**EFORE sighting the lightning, the astronauts witnessed a phenomenon never before seen by a human: an earth eclipse of the sun.

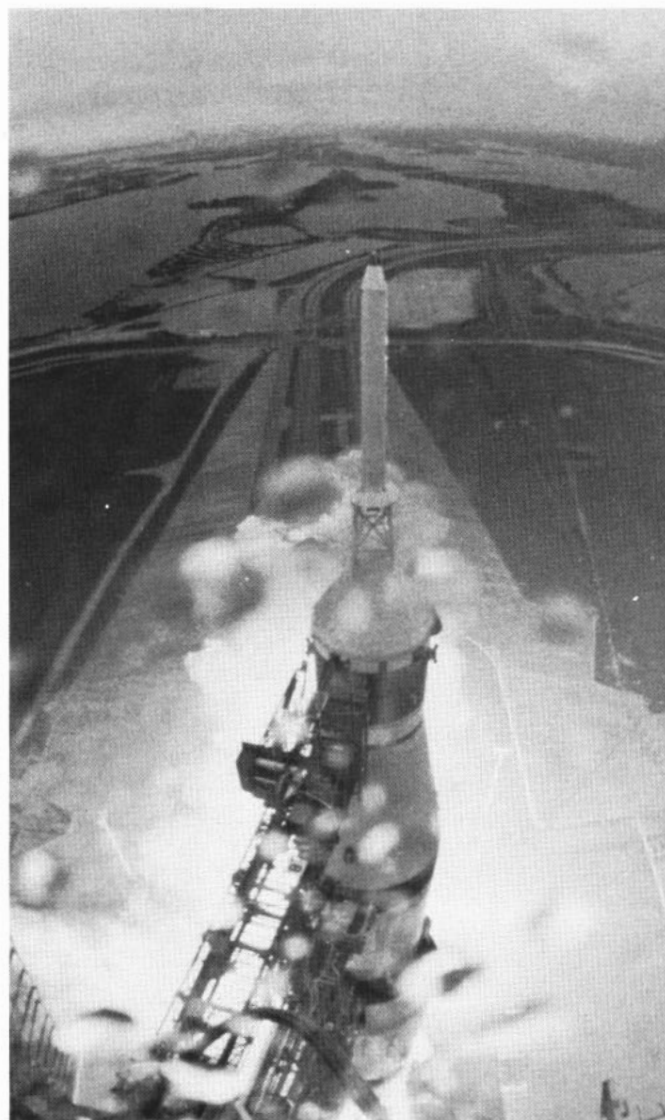
Bean announced to mission control at 1230 the day of splashdown that *Apollo* could see that the sun was behind the earth.

"The clouds appear sort of pinkish gray and they're sort of scattered all the way around the earth. It's really a fantastic sight. This has got to be the most spectacular sight of the whole flight," he said.

The astronauts reported that the spectacle seemed to multiply as *Apollo* moved closer to earth directly over the Indian Ocean.

"Spectacular" was only one of many adjectives the astronauts used during their moon mission. "Fantastic, outstanding and amazing" were among others recorded, especially during the landing on the moon, which turned out to be a blind maneuver by Conrad.

**Apollo 12 lift-off is recorded at the 360-foot level of the launcher.**





**H**ERE'S A PARTIAL text of the conversation heard between the astronauts on the moon and the ground controllers in Houston, beginning with *Intrepid's* descent from the other ship to the landing site:

Conrad—Passing 12,000 feet . . . out there, think I see my crater . . . There it is! There it is! Son of a gun, right down the middle of the road . . . amazing . . . fantastic. . . .

Bean—Come on down, Pete. You can come on down. 190 feet. 180 feet. You're looking good. Slow down the descent rate. 80 feet . . . 70 . . . you're looking real good. Watch for the dust. 40 feet . . . 30 feet. You've got plenty of gas. He's got it made. Contact



Astronauts rehearse experiment to be set up later on the moon's surface.

light . . . drop . . . probe (touchdown on the moon).

Conrad—We're in good shape, Houston. Engine off.

Bean—Holy cow . . . it's beautiful out here. That's something else.

Ground—*Intrepid*, congratulations.

Conrad—Thank you, sir. You guys did an outstanding job. That thing was right down the middle . . . Boy, I can't wait to get outside. Look at that!

Later, Conrad described the landing as being a little rougher than it sounded, mainly because he turned off the engine while *Intrepid* was still about six feet from the moon's surface.

"That's the only way I could see where I was go-

ing," he explained, referring to the massive dust cloud that was created by the exhaust from the lunar module's rockets.

Nonetheless, the landing was right on the money—1120 feet from the target crater.

**E**XUBERANCE in the astronauts' voices was especially noticeable during their first walk on the moon, the second by humans. Conrad started things off with an arousing "Whoopie!" as he exited the module.

"That may have been a small one for Neil, but it's a long one for me," he explained, jumping from the lunar module ladder onto the moon's dusty soil. He was referring to the historic remark made by Astronaut Neil Armstrong of *Apollo 11* fame who said of his first step on the moon last July: "that's one small step for man, one great leap for mankind."

The *Apollo 12* crew was less somber. Laughter and singing and a sense of excitement filled the airways as Conrad and Bean became familiar with the fantasy-like environment of the lunar satellite.

"Baby, baby. This is the life," Conrad exclaimed. "It really is great here . . . you can hop like a bunny . . . I'm beginning to feel like Bugs Bunny."

The lunar command pilot was obviously moonstruck, a mannerism that seemed to remain with him throughout his stay on the moon. In nearly every sense of the world he was the jovial jester of the mission; the first man on the moon to sing, with his "dum-dum-de-dums" echoing over a 233,000-mile span for all the world to hear.

**B**EAN, while every bit as exuberant, nonetheless appeared to have cast himself as the straight man. In either case, there was no doubting that while they had journeyed to the moon with a seriousness of purpose, to gather rocks and explore craters, there could be no doubt that they were going to enjoy themselves in the process. And they did, describing their experiences in detail.

This, more or less, became necessary for the astronauts—to tell about every step taken and the extent of each moment's activity—after the TV camera ceased to operate early in their first walk. All efforts failed to revive the electronic eye-link with the world, even blows from a hammer. As a result, it wasn't until *Intrepid* redocked with Yankee Clipper nearly two days later that live telecasts from space were again seen on worldwide TV.

Except for the television failure on the moon, the balance of *Apollo 12's* mission was carried out almost flawlessly.

**D**URING their initial walk, lasting four hours and one minute, Conrad and Bean set up an array of scientific experiments. These they placed in the Ocean of Storms, a spot about 600 feet from the lunar module. The experiments should provide scientists here

on earth with more knowledge about the moon than ever before known to man.

The package, referred to as ALSEP—Apollo Lunar Surface Experiments Package—consists of five main experiments: 1) a solar wind spectrometer; 2) a lunar ionosphere detector 3) a lunar atmosphere detector; 4) a magnetometer; and 5) a highly sensitive seismometer. All are electrically powered by a compact nuclear power source called SNAP 27.

From data received from these experiments, scientists hope to uncover many mysteries of the earth's satellite, everything from its internal formation to its atmosphere to its age and importance in space. This ALSEP probe is only the beginning, but an important one.

#### **The Solar Wind Spectrometer**

Through the solar wind spectrometer experiment, scientists hope to discover whether or not the sun's solar wind has any effect on the moon. The solar wind is a steady source of atoms traveling at 12,000 miles an hour. It penetrates all outer space.

Earth, however, is protected from the solar wind by a magnetic field which deflects the otherwise permeating rays. Nevertheless, the wind is responsible for creating magnetic storms which cause radio interference. On the other hand, the solar wind is the chief contributor to earth's northern and southern lights.

#### **The Lunar Ionosphere Detector**

The lunar ionosphere detector is a device designed to read the moon's atmosphere. There is believed to be very little atmosphere on the lunar surface. What there is is probably produced from out-gassing of rocks. However, artificial atmospheres have been introduced to the moon from the exhaust gases of the unmanned and manned lunar probes. Through the detector, scientists hope to evaluate the moon's ability to retain such atmospheres.

#### **The Lunar Atmosphere Detector**

Working hand in hand with the ionosphere experiment is the lunar atmosphere detector. This instrument is designed to measure the moon's atmosphere, its density and temperature. Several results can be derived from such a study. Scientists may learn something of volcanic activity (if it exists) and the presence of various gases, such as that created by the impact of meteors on the moon.

From the ionosphere and atmosphere experiments, scientists believe they will discover the source of the moon's history and perhaps avenues to its future.

#### **The Magnetometer**

The moon has a very slight magnetic field, evidenced by the manner in which the moon men have bounced about its surface like "Bugs Bunny."

How the moon is affected by the current it receives from the solar magnetic field passing by is being de-



Navy UDT swimmers and copter from HS-4 practice with mockup of the Apollo 11 command module.

termined by the magnetometer experiment. Actually, three magnetic sources affect the moon's gravitation force: that of its own, the sun's and the earth's. To what extent is the question. It is also hoped that the temperature of the moon's interior will be able to be determined through this experiment.

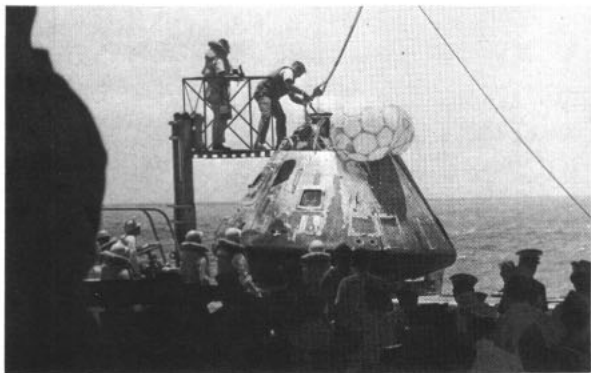
#### **The Seismometer**

The fifth experiment set out by Conrad and Bean—the seismometer—is being conducted to determine two basic facts: what the interior of the moon is made of; and the amount of energy released from within the moon.

The moon's structure could be like that of the earth's which consists of a core, a mantle and a crust. Or, it could consist of the same material throughout, like a solid rubber ball. On the other hand, it might have a honeycomb structure. This latter possibility was judged a strong probability based

Frogmen greet spacemen while waiting for pickup.





Navy men watch as the spacecraft is brought aboard cruiser.

on data gathered after the lunar module, *Intrepid*, was sent smashing into the moon in the first major test of the seismometer experiment.

As for the energy question, if there is radioactive material present on the moon, then there's a possibility heat could generate volcanic activity. If there is not, then perhaps the moon is cold, geologically dead. In short, the scientists want to know if the moon is alive or dead.

#### SNAP 27

All five of the ALSEP experiments are powered by electricity generated by the nuclear power system—SNAP 27. This compact, 40-pound power source is de-

signed to generate 63 watts of electricity, enough to operate the ALSEP experiments continuously at peak performance for longer than one year. It should still be producing energy even after *Apollo 13*, *14* and *15* missions have been completed.

The SNAP 27 power source is a cylinder of plutonium 238, a radioactive isotope which creates heat as it decays. This heat is converted into electricity which in turn powers the experiments. On the moon the temperature of the isotope registers up to 1000 degrees Fahrenheit.

In addition to setting up the ALSEP experiments, *Apollo* Astronauts Conrad and Bean conducted a few scientific chores themselves during their 31½-hour stay on the moon.

First, they gathered rock and dust samples. Many of the rocks, they discovered, were of a different composition than those found by the team of *Apollo 11*, which landed in Tranquility Base, 945 miles west of the Ocean of Storms. Altogether during their eight hours of lunar strolling, the *Apollo 12* astronauts picked up about 90 pounds of rock.

It was during their second walk on the moon—it took them over nearly a mile of unexplored area—that Conrad and Bean examined and retrieved parts of the

USS Hornet (CVS 12) stands by during recovery operations.





*Surveyor 3* space craft. The primary target of *Apollo 12*, *Surveyor 3* appeared undamaged, but had turned brown after its two-and-one-half-year stay in the lunar atmosphere. It had been there since April 1967.

Using a pair of metal cutters, the astronauts removed *Surveyor's* TV camera, a painted aluminum strut, an electrical cable and a mechanical claw scoop used for digging into the lunar soil.

Moments before, Conrad and Bean had collected rocks the size of grapefruit during the first minutes of their exploration. Then they inspected the ALSEP package of experiments they had placed during their first walk, rolled a rock into the Head Crater as part of a seismometer test, and took samples of glass-like deposits near the crater. The duo proceeded to take a bedrock sample at Sharp Crater and then moved to a spot near Halo Crater where they took a core sample of the moon's crust.

Near where *Surveyor 3* had settled, the astronauts discovered strange lines in the lunar soil. They could not explain their origin.

The last task of their walk was dismantling *Surveyor* before returning to *Intrepid* to make ready for liftoff from the moon.

#### Multispectral Photographs

Meanwhile, Astronaut Richard Gordon, Jr., orbiting some 70 miles above in the mother ship *Yankee Clipper*, was taking multispectral photographs of the moon surface. Multispectral photography, as applied in this case, should provide scientists with pictures that reveal the composition of minerals on the moon.

The system was set up with four cameras loaded with black and white film, each equipped with a different colored filter—one green, one blue, one red, and one infrared. By comparing the color of one photographed area of the moon to that of a similar color on another area, scientists hope to be able to determine the spectral signature of moon materials.

This will enable them to construct a contour color map of the moon showing the various mineral configurations around the lunar surface. A great help in the project will be the study of the rock specimens brought back, and the comparison between their color and the color of the photographed area from which they were taken.

#### Future Sites Photographed

*Intrepid's* blastoff from the lunar surface went off without a hitch. Within three and a half hours, Conrad and Bean had rejoined the lonesome eagle of the team in *Clipper*. Shortly afterward, the lunar module was separated from the mother ship for the last time and sent crashing into the moon. It landed some 40 miles from where it had set down softly two days before.

In their final orbits of the moon, the three astro-



Spacecraft splashes down 2.5 miles from USS *Hornet*.

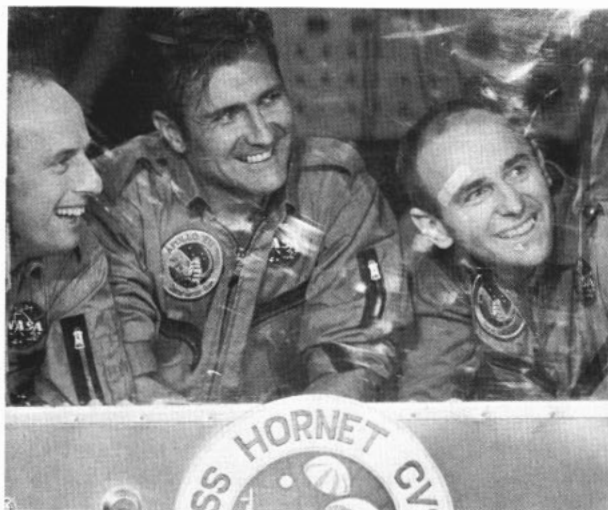
nauts took additional photographs of the lunar surface. They concentrated on areas singled out as probable future moon landing sites, such as the Fra Mauro area near the equator, earmarked as favorable for the March flight of *Apollo 13*.

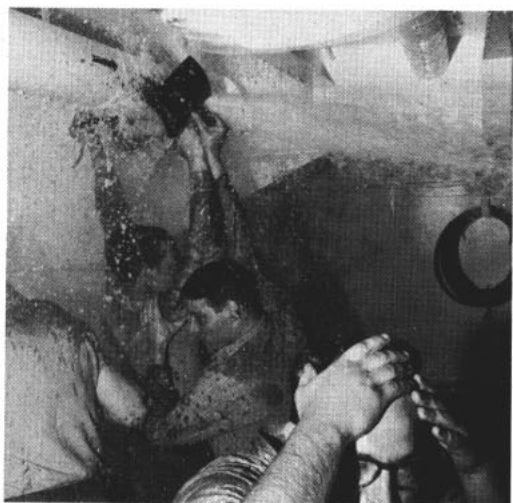
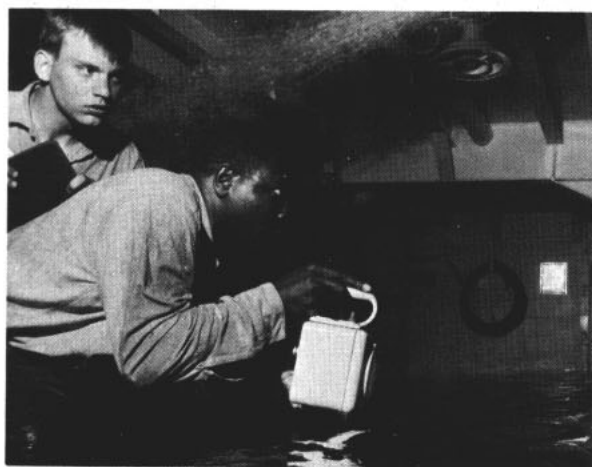
This last lunar chore complete, the astronauts headed homeward in typically good Navy spirit, sending this message to Rear Admiral Donald (Red Dog) Davis, Commander of the Hawaiian Sea Frontier:

"Dear Red Dog: Apollo 12 with three tail hookers (carrier pilots) expects recovery ship to make its PIM (point of intended movement, or rendezvous at splash-down) as we have energy for only one pass. Pete, Dick and Al."

—JOC Marc Whetstone, USN.

Navy Captains Charles Conrad, Jr., Richard F. Gordon, Jr., and Alan L. Bean give the world a big smile via TV through the window of the Mobile Quarantine Facility.

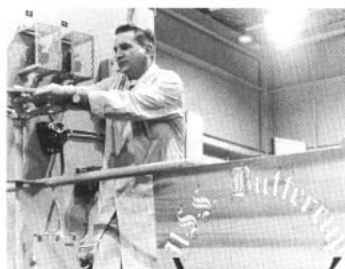
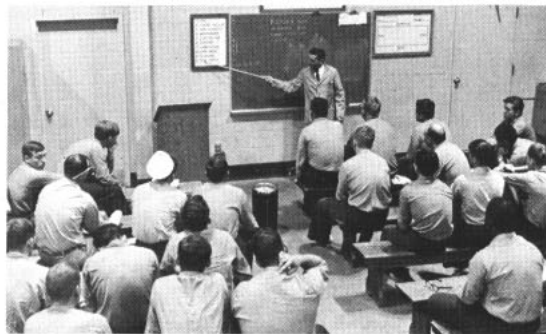




# **USS Buttercup Goes Wet & Wild**



Opposite page from left: A wooden plug is hurried to the scene. (2) Two investigators find the problem. (3) An attempt is made to stop water gushing from a ruptured pipe. Clockwise from above: An instructor sums up performance. (2) A race against time to plug the "hits." (3) DC students receive beforehand instructions. (4) Water is sent into the *Buttercup*.



**B**UTTERCUP has never sailed. Still, she plays a major role in maintaining the safety of those that do. She has an official name—the Wet Environmental Trainer—but for the two years she has been in operation, to the 30,000 men who have boarded her, she has always been referred to as "*Buttercup*."

Navy men meet *Buttercup* at the end of a week of damage control team training at the Fleet Training Center, Norfolk, Va., after studying the principles and techniques of saving a ship in danger of sinking, more commonly called damage control.

The 50-foot-long, 25-foot-wide steel replica of a ship has all the features of a ship, except she doesn't get underway. Instead, she's designed to sink in 50 feet of water.

A typical Damage Control exercise runs like this: The scene is the deck of *Buttercup*. The damage control instructor has the men simulate sleep (never painful for Navy men).

All lights are out.

Then he plays recorded sounds of an air strike, punctuating the recording with the announcement, "Hit—port side. Start your investigation."

The senior instructor, Chief Damage Controlman Wendyl Adams, makes it sound as real as possible. "It's scary enough to be real," relates Adams, observing the men scramble into action, applying the principles they have been hearing about all week in class. "They never think of this as a game."

A hatch leading to the decks below is lifted and an investigator steps into the darkness with a battle lantern. He follows the sound of gushing water with his light, finding his way to the problems: several small "hits" (holes) amidships and a ruptured pipe spurt water under 90 pounds of pressure.

Shouts of team captains echo against the side of the ship while phone talker messages stream to Damage Control Central, the nerve center and directing force of the entire DC team.

**D**C CENTRAL's purpose is to collect and compare reports from various repair parties throughout the ship, then determine the condition of the ship and action necessary to bring her to combat readiness.

Once the damage is found, sledge hammers, wooden plugs and planks are carried to the compartments and braced against the hatches to make them as watertight as possible.

The team captains call for the equipment which, were this an actual race against time, could mean the difference between saving or losing a ship.

Meanwhile, as water fills the compartment at a steady pace, the men race a 20-minute time limit, hammering plugs into the holes scoring points on a 106-point rating scale. If the holes are not found and repaired quickly, an arrow on the main deck indicates the ship is sinking. At a certain angle of list, she is considered lost.

The teams move with a sense of direction that comes from working together. Teams either come from classes at the school, precommissioning details or actual repair parties aboard ships. Repair parties aboard ship generally do the best job.

**S**OME TEAMS are so efficient that they score a perfect 106-point rating. "I'd feel safe on any ship that these men served on," says Chief Adams. "They leave here qualified as lifesavers, in a sense."

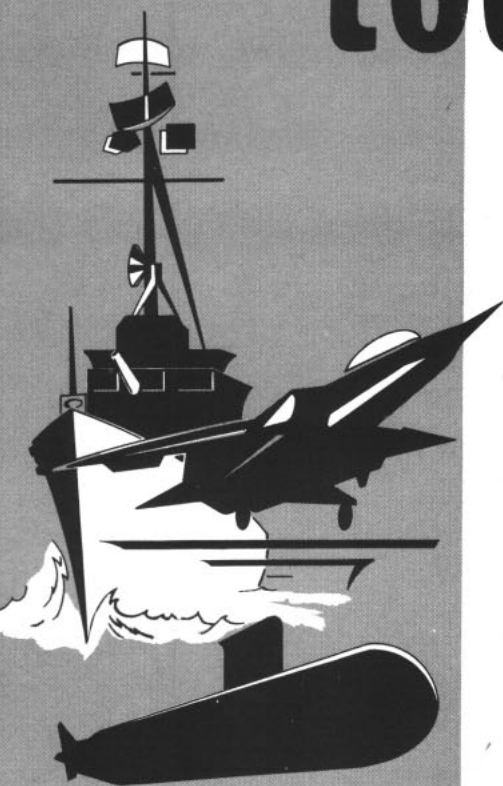
The situation at Fleet Training Center Norfolk is ideal, of course, and carefully controlled. Nevertheless, many of the instructors and men from ship's repair parties who have attended the school agree: there is no way to estimate how many lives the ship that has never sailed has saved.

—Story by JO2 Robert R. Little

—Photos by PHC Ron Oliver



# today's navy



## ACTOV Goes Active

The second of five Navy Coastal Surveillance Centers in the Republic of Vietnam has been turned over to the Vietnamese Navy.

The transfer, part of the U. S. Navy ACTOV Program (Accelerated Turnover to the Vietnamese), took place at Qui Nhon six days after the turnover of 13 U. S. Navy *Swift* boats (PCFs). The *Swifts* are now operating in the Second Coastal Zone from the Qui Nhon surveillance center.

The mission of the Qui Nhon facility is to direct Operation Market Time missions in the northern portion of the Second Coastal Zone. Market Time has the job of surveillance and counter-infiltration patrols along the Republic's 1200-mile coastline.

There are five such surveillance centers in-country. The center at An Thoi on Phu Quoc Island has been under the operational control of the Vietnamese Navy since 1 Jun 1969.

The turnover of the 50-foot boats brought to 242 the total number of U. S. Navy craft turned over to the RVN, at that time. It was the second substantial transfer of U. S. gunboats during October 1969. Previously, 80 river patrol boats (PBRs) were transferred at the Saigon Shipyard.

The Vietnamese crews of the *Swift* boats will be supported by a detachment of U. S. Naval Support Activity personnel at Qui Nhon. They will work closely with the U. S. Navy's Inshore Underwater Warfare Group (IUWG) Detachment, which serves as Qui Nhon's harbor patrol unit.

Vietnamese Navy crewmen manning the *Swifts* are graduates of the U. S. Navy's Small Boat School in Saigon. An on-the-job training period with U. S. Navy *Swift* boat crews completed the training requirements.

Farther to the north, in Da Nang, four LCM-8s — medium

landing craft — were also transferred to the Vietnamese Navy.

Formerly attached to the Lighterage Division of the U. S. Naval Support Activity there, the LCMs were used to haul cargo along the coast and up the rivers in the I Corps Tactical Zone. Under Vietnamese command, the boats have remained in the I Corps, operating in the five northernmost provinces of the Republic.

The LCMs were the second ACTOV boat transfers to take place in Da Nang. The first Da Nang turnover was LCU 1475, which is now serving as a troop transport and assault craft with Vietnamese forces in the Mekong Delta.

## Kennedy Bandsmen

The members of Unit Band 146 are among the big winners of friends and influencers of people aboard *uss John F. Kennedy* (CVA 67). During a Sixth Fleet deployment in the Med, the band plays dozens of concerts for thousands of people in each port *Kennedy* visits.

Besides the in-port concerts, the 18-piece organization and its combos can be heard aboard ship, too. For example, the suave James Boys Trio is used for formal dinners while a six-piece, rock-and-roll combo has been heard in many a messroom.

Like many another ship's band, Number 146 is always on hand to provide music to unrep by at any hour of the day or night.

Of all their assignments, however, the bandsmen enjoy the port concerts above most. One, they remember fondly, was played in Trieste, Italy, for around 2000 people in the Piazza Unita. The concert was scheduled to last only one hour but continued by popular demand for more than two and a half hours.

In Malta, the band played each of the 11 days *Kennedy* was in port.

The tight schedule the band maintains cuts down considerably on liberty time but the bandmen enjoy their job. This may account for their being credited by Commander Carrier Division Two for being a major factor in the success of the division's people to people program in the Mediterranean.

### Bronze Star for Boyd

As personal inspections go, it was more than routine, especially for Boatswain's Mate 1st Class Howard Boyd.

He received the Bronze Star Medal with combat V.

The citation accompanying the medal cited Petty Officer Boyd for meritorious service in the Republic of Vietnam from February 1968 to February 1969. For this same period, he was also awarded a Presidential Unit Citation and a Combat Action Ribbon during the ceremony.

As a boat captain in Vietnam, Boyd participated in more than 180 patrols, coming under hostile fire on several occasions. He reportedly boarded and searched 9000 sampans and junks along enemy infiltration routes.

Although the Bronze Star award is representative of his over-all performance under combat conditions, the heroic Navyman was cited for one incident in particular which occurred in March 1968.

While searching a junk, BM1 Boyd saw the merchant ship *Anta*

come under a Viet Cong rocket attack. He leaped from the junk into his boat, executed an emergency breakaway and maneuvered his craft directly through the enemy line of fire, delivering a highly effective barrage of fire into the enemy position.

Petty Officer Boyd is now serving on board the submarine tender USS *Hunley* (AS 31), homeported at the Naval Weapons Station, Charleston, S. C.

### Bomb Cook-off

Bomb cook-off, in ordnance jargon, means subjecting a bomb to such intense heat that it will explode. The result of a bomb cook-off is often lethal and frequently occurs within 90 seconds. Aircraft carriers are particularly vulnerable to this danger if flaming jet fuel spreads across the flight deck.

To lessen the peril, the Naval Ordnance Laboratory at White Oak, Md., undertook the problem of delaying the explosion of bombs cooking in jet fuel. As usual, it found a way.

First, it discovered the thin-walled, 250-pound Mark 81 bomb was the most vulnerable to cook-off.

In normal production, the cavity of the Mark 81 is lined with asphalt which, among other things, insulates the explosive. The lab decided to increase the insulation of the bomb without changing its

shape or increasing its size.

To do this, NOL added a high-melting point wax to the asphalt liner giving it a greater viscosity which permitted coatings up to one-quarter-inch thick in one application.

A layer of intumescent paint was also added to the bomb's exterior. When the paint was heated it foamed thus forming an insulating layer of residue.

To test the effectiveness of its delaying factors, NOL used two bombs in tandem. One was filled with sand and the other with explosives. Both were suspended over a flaming pool of standard jet aircraft fuel.

Both bombs contained insulated thermocouples that measured the heating rate.

The tests proved that greater safety had been obtained even though the cooking results were not uniform. Sometimes, the explosive burned off without seriously damaging the bomb casing while, in other instances, the casing opened up releasing a shower of burning explosives.

In all tests, however, neither the fuze nor the booster elements detonated—even partially. The combination of NOL's intumescent paint and modified liner had lengthened the bomb's cook-off time to NOL's goal of at least five minutes—long enough to give firefighters a chance to subdue the flames.

CVA-66/67 NAVY'S NEWEST WEAPON?—No, it's not a super aircraft carrier with two islands, but merely a "family reunion." Sister ships USS *America* (CVA 66) and USS *John F. Kennedy* (CVA 67) met for the first time since their commissionings. Photo by PH3 J. C. Shaibley, USN.



## How to Prevent Tragedies

Fire on the flight deck! A pilot is dead.

Lambert Munroe is helping the Navy learn how to prevent such tragedies. He works on materials for flight suits, to find out how to keep a fire outside from burning the man inside.

Munroe is a physical science technician involved in research at the thermal laboratory, Naval Air Development Center, Johnsville, Pa. His work with Alice Stoll, recipient of the 1969 Society of Women Engineers' Achievement Award, has contributed significantly to man's knowledge of the effects of heat on the human body.

Finding the right materials for flight suits isn't easy. They must be comfortable to the men wearing them, but must resist the heat of a fire.

Munroe is co-inventor of one important research tool: a flame heat transfer analyzer. Materials could be tested with a blowtorch, he says, "but our device can carefully control the flame applied to the testing material."

In the device, a material simulating human skin contains a ther-

mocouple — a heat-measuring device. The material to be tested is laid on top of this, and a controlled flame applies varying degrees of heat to the material. The thermocouple records the amount of heat that is transferred through the material to the "skin."

For even more realistic testing, a life-size dummy dressed in a flight suit is suspended from a crane and passed through a real fire of aviation fuel. Heat-sensitive paper placed on strategic spots on the dummy changes color in the test, revealing what would happen to a man's skin.

Munroe is now developing a telemetering system for transmitting the temperature data from the dummy while it is still in the fire.

Ordinary fire isn't the only danger to aviators in modern warfare. Munroe operates another testing device, a heat source that approximates the 4000-degree radiation heat from a nuclear explosion, to develop a protective cover for the body in these extreme conditions.

Out of such research came the present standard Nomex material for flight suits, which meets both requirements — comfort and protection.

Fire on the flight deck will never be a negligible matter. But thanks to Lambert Munroe and others, naval aviators will have a much better chance of coming out alive.

## Gun Barrel Fire Hose

Photos taken during recent aircraft carrier fires at sea showed destroyers alongside using fire hoses lashed to their gun barrels in order to provide protection for the firefighters and a means of directing the stream of water on the fire.

This inspired the crew of the destroyer *uss Radford* (DD 446) (she has since been decommissioned under Project 703) to devise a system that allows a fire hose to be run up through a 5-inch/38 gun barrel.

The following report on the system recently appeared in the Pacific Fleet's Cruiser-Destroyer Force magazine *Vigilance*:

"A two-and-one-half-inch fire

hose is run through the hot shell scuttle and through the gun barrel and then attached to the threaded pipe. The assembly is then inserted in the gun barrel with the sleeve making a solid fit around the outside of the gun barrel. A standard all-purpose nozzle or a 'suicide' nozzle can be used.

"Since the hose-to-pipe connection is watertight and the nozzle is attached to an outside extension of the pipe, no water is introduced into the gun mount. Careful alignment of the pipe and the size of the hose coupling eliminate any metal-to-metal contact inside the gun barrel.

"Use of the system would be restricted to those gun mounts through which a fire hose can be passed and would only be practical for closed-manned mounts. The device would be useful for assisting in fighting fires on any type of ship underway, particularly if danger of intense heat or explosion is present."

*Radford* developed the system into a working model, and to date is the only DD (or other ship, for that matter) known to have tested it successfully, or adopted it as a means of firefighting.

## Ensign Observers

The clouded coast of Vietnam and the fishing boats dotting the waters offshore were familiar sights to the two young ensigns looking from the bridge of a Seventh Fleet destroyer.

It was their home country, after all.

Ensigns Le Dung and Tran Anh Tuan, Navy of the Republic of Vietnam, were on board *uss Hull* (DD 945) for a two-month orientation cruise. Their assignment was to learn as much as possible about the ship, looking toward the day when Vietnam may have its own deep-water navy.

They had just graduated from the Vietnamese Naval Academy with outstanding records; ENS Tuan ranked first in the class and ENS Dung fourth. *Hull's* executive officer said: "We expect the most of them."

Protecting naval fliers from the hazards of fire is one of the areas researched by Lambert Munroe, a technician in the Thermal Radiation Lab of the Aviation Research Dept., Naval Air Development Center, Johnsville, Pa.





**MANY MEDALS**—SEAL Team Two members, based at Norfolk, Va., await presentation of medals by VADM Luther C. Heinz, Commander Amphibious Force, Atlantic, at Little Creek Naval Amphibious Base. Thirty-five SEALs received 58 awards, among them four Silver Stars and 21 Bronze Stars. Since its men began operating in Vietnam 33 months ago, SEAL Team Two has won 392 awards.



The young officers had never been on vessels larger than coastal patrol boats before they came aboard. They spent the first few days adjusting to the size, organization and routine of the destroyer — and learning shipboard customs.

"When they first came aboard, they saluted all the time," an American officer recalled. But, like other eager new ensigns, they soon learned when courtesies were, and were not, expected.

When she arrived on the gunline, the destroyer wasted no time introducing the Vietnamese to an officer's combat duties. Both stood bridge and CIC watches and received instruction in navigation, weapons and general ship organization.

In one area, however, they needed little training. "These Vietna-

mese can break down and assemble every small arms weapon we have aboard," said a chief gunner's mate. "They are well trained."

The hardest adjustment had nothing to do with their duties. "Meat and potatoes tear them up," said the XO. "We now have rice available regularly in the wardroom, and both of them are doing fine."

The orientation program is sponsored fleetwide by the Commander, Naval Forces Vietnam. Many Vietnamese Naval Academy graduates are sent to gunfire support ships for deep-water training and the opportunity to learn how the U. S. Navy operates.

Asked his impression of *Hull*, ENS Tuan said: "I like it because it is a prestige ship. Maybe we will have a destroyer in our navy. I

hope to be on it if we do."

—Story by JO3 Michael W. Rash

—Photos by PH2 William J. Matella

### Seal Team Awards

Fifty-eight medals including four Silver Stars and 21 Bronze Stars were awarded to 35 members of SEAL Team Two recently during a ceremony at Norfolk.

This brought to 392 the number of medals and awards earned by the team since it began operations in Vietnam three years ago.

Vice Admiral Luther C. Heinz, Commander Amphibious Force, Atlantic, presented the medals and described the team as "one of the finest and most successful military units in any service."

The SEALs have conducted many successful counter-guerrilla operations in the Mekong Delta.



**BIG MONEY!**—(L to R) GMG2 Dewey W. Thedford, MM2 George P. Bluntschly and MM2 James W. Thompson received a total of \$26,710 when they reenlisted for six years each aboard USS *Alamo* (LSD 33).

### Chief Stoos Makes It Work

Master Chief Boilerman Aloysius M. Stoos was annoyed. The cause for his bad humor lay in a balky part called a sliding foot found on the main propulsion boilers of many destroyers. It seems that old grease on the foot often hardened, making penetration of new lubricants almost impossible.

The resulting improper lubrication caused all kinds of havoc in the boiler room and the remedy often required the services of a shipyard contractor and about 21 man-days of work.

But that was before Chief Stoos had a better idea. Its execution required no expensive equipment — just a pressure grease gun and a grease solvent, five gallons of which would take care of four destroyer-type boilers.

The new method was not only less expensive, it consumed less time (about eight days) and the job could be done by a ship's company. Chief Stoos knew because he had tried it successfully in four ships.

Master Chief Boilerman Stoos not only has less trouble with ships'

boilers now; he also received a pat on the back and \$1290 in the bank for submitting a money-saving beneficial suggestion.

### Canopus Muffled

Testing an overhauled boat engine used to be a noisy business aboard the submarine tender USS *Canopus* (AS 34). But no longer. Now, thanks to the ingenuity of the ship's engineers, *Canopus'* maintenance crew works in relative quiet while servicing small boats for FBM submarines stationed at Holy Loch, Scotland.

A means to stifle the engine noise stemmed from a project undertaken while the ship was undergoing an overhaul of her own recently in Bremerton, Wash. The maintenance and repair shop salvaged a small exhaust muffler from a scrapped destroyer and, after making necessary valve adjustments to the system, connected it to the engine testing equipment.

The success of the project, maintains the crew, rests on the fact that the sound coming from the muffler is so quiet that it doesn't even disturb sheep grazing in the nearby Scottish highlands.

### Alamo's Bonuses

Three 2nd class petty officers received a total of \$26,710 in bonuses when they reenlisted together on board USS *Alamo* (LSD 33) last December in Long Beach.

All three reenlisted for the first time for a six-year hitch.

Machinist's Mates 2nd Class George P. Bluntschly and James W. Thompson each received \$9414 as they shipped over in the STAR Program. They were to be given 28 weeks of compressed-gas schooling.

Gunner's Mate (Guns) 2nd Class Dewey W. Thedford reenlisted in the SCORE Program and received \$7092, along with the opportunity to change his rating to Gunner's Mate (Technician).

MM2s Bluntschly and Thompson have been shipmates on board *Alamo* for nearly three years, and have made two cruises to the Western Pacific. GMG2 Thedford joined *Alamo* last September after a year's duty in Vietnam on *Swift* boats.

### Mount Blades

Commander J. L. Blades was told that a mountain in Antarctica had been named after him. As might be expected, he felt "very honored."

Mount Blades was discovered in photographs taken by Antarctic Development Squadron Six (VXE 6) when CDR Blades was CO of the 1965 Operation Deep Freeze wintering-over party.

For his contributions to the exploration program, the U. S. Board on Geographic Names recently advised him that the mountain would officially carry his name.

Now in Naples with the staff of the NATO Allied Forces, Southern Europe, CDR Blades recalls that duty on the ice was some kind of experience. Here are some of his recollections.

"After a while, you get used to seeing nothing but white."

And then you become increasingly interested in science.

"One of the most interesting experiments was with penguins born during the Antarctic summer.

"When winter moves in, the edge of the ice shelf moves out to sea

and the penguins sometimes travel up to 2000 miles to stay close to their feeding grounds.

"But the next summer they return to within a couple of feet of the spot on which they were born."

Instinct?

"That may be part of it, but some experiments suggest the penguins use the sun as a navigational aid.

"We flew some of the birds several thousand miles from their rookery and released them. The scientists who monitored their progress observed that, on sunny days, the penguins headed straight for the nearest open water to feed, and then continued directly toward their rookery.

"But if the day was overcast, the birds just milled around, unsure of which direction to take."

It was not the commander's first trip to Antarctica, nor his first expeditionary duty.

"In 1952, I was O-in-C of the helicopter detachment aboard the icebreaker *Burton Island* when she attempted to retrace the northwest passage through the Beaufort Sea."

He later was CO of one of the first tankers to arrive at McMurdo Sound when the Navy began Deep Freeze operations in 1955.

"Things were pretty rustic that first year. We simply left the ship at McMurdo for use as a storage tank for aviation fuel."

The frozen continent continues to be explored as the Navy has entered its 16th year of Deep Freeze operations.

"There have been improvements in habitability. The Seabees are completing a building for 250 men which has berthing, messing, laundry, barber shop and recreational facilities for the entire wintering-over population.

"Everything has to be compact, because moving around outside during a storm is almost impossible.

"During the winter I was on the ice, we had to run lifelines between buildings."

About the report that seven women were among this year's contingent of scientists and reporters?

"There will be fewer beards than ever before."



**DEEP FREEZE**—Commander J. L. Blades tries his hand with a dog sled and team of huskies, one of the easiest means of transportation across the Antarctic icecap.

### VP-11 Weightlifters

The last performer to arrive slipped on a tee shirt, did a couple of knee bends, and asked for directions to the stage.

The doors to the auditorium were opened and the girls who had been waiting outside took the seats up front.

It was the first State of Maine Powerlifting Championships, organized and directed at NAS Brunswick last September by the Patrol Squadron 11 Barbell Club, and sanctioned by the AAU.

And when the strain of the competition was over, the VP-11 weightlifters had won State team honors and 13 individual trophies, including three State weightlifting records.

The success story of the VP-11 Barbell Club took only about two months to write.

It started last July when Aviation Electrician's Mates 2nd Class Chuck Carnobas and Frank Shuleski began a campaign to organize the squadron weightlifters and expand the facilities available to them.

The goal was a club workout room with equipment suitable for

serious weightlifting.

The AEs found a deserted room on the base and received permission to use it as a clubhouse. Interest in the VP-11 Barbell Club spread, and membership increased.

Club members modified the room with material they purchased from local lumber yards, and equipped it with their personal weightlifting gear. They then began serious workouts with an eye on the State of Maine Powerlifting Championships.

The payoff came when Kirsten Bell, Miss Maine of 1969, presented the VP-11 musclemen with trophies and those girls in the audience sighed in approval.

### Reconversion for DDG 36

USS *John S. McCain* (DDG 36) is completing the final stages of her reconversion at the U. S. Naval Shipyard in Philadelphia, Pa. When the work is completed a great deal will have been added.

*McCain* is a 4730-ton guided missile destroyer with anti-air and antisubmarine warfare as primary missions. During her conversion period in the Philadelphia Naval





USS America shows her maneuverability as she makes a turn on the high seas.

shipyard, a new *Tartar* surface-to-air missile system was installed, complete with new fire control and target acquisition radar and computers, significantly increasing her defensive capabilities.

Her ASW arsenal includes anti-submarine rockets (ASROC), six torpedo tubes, and two 5-inch/54-caliber rapid-fire gun mounts. Capable of speeds in excess of 30 knots, *McCain* carries a crew of 19 officers and 309 enlisted personnel.

The name of the speaker at the recommissioning of *uss John S. McCain* (DDG 36) had a familiar sound. It was Admiral John S. McCain, Jr., Commander in Chief Pacific. He is the son of the man for whom the guided missile destroyer is named, and a proponent of the fast task force concept of naval warfare made famous during World War II.

"For almost a quarter-century, the highly mobile task force has been an important arm of U. S. foreign policy," CINCPAC said.

Admiral McCain additionally cited *uss McCain* as an example of "our deterrent capability" that will operate in the broad realm of national security.

The ship was launched as a *Mitscher*-class frigate on 12 Jul 1952, and first commissioned in October the following year at the Boston Navy Yard. Originally an Atlantic Fleet ship, she was transferred to Pearl Harbor in 1958.

While serving in the Western Pacific, *McCain* distinguished her-

self in patrol duty in the Taiwan Strait during the communist shell-

## A Final Tribute to USS Hornet

Ships with the name have been sloops, sidewheelers and aircraft carriers. One ran the British blockade in the Revolution. Another fought at Tripoli. A third engaged and captured a British brig in the War of 1812.

One of the later versions served as a base for General Jimmy Doolittle's raid on Tokyo.

The latest added prestige to the name during World War II, and most recently recovered the U. S. astronauts who first visited the moon.

In all, eight ships have been named *Hornet* since the first was commissioned in 1775. And the record of almost-unbroken service these ships compiled is recalled as the latest member of the family, *uss Hornet* (CVS 12), prepares to retire.

The adventures of these ships began in Baltimore in 1775 as Americans began the fight for independence. A little sloop-of-war with 10 long nine-pounders was commissioned *Hornet* and assigned to duty in the Bahamas. After several engagements, it is believed that she fell into British hands on the South Carolina coast in 1777.

The second *Hornet*, also a 10-gun sloop, was purchased in Malta in 1805 and participated in the attack on the Port of Derna during

ing of Quemoy in 1958, a mercy mission to a fire-ravaged town on the island of Amiami O Shima, flood relief near Calcutta, a rescue of the crew of the sinking Japanese freighter *Shinwa Maru*, and gunfire support action off the coast of Vietnam.

Her classification was changed from DL 3 to DDG 36 in 1965, and a year later she began her conversion and overhaul at the Philadelphia Naval Shipyard.

*McCain* is 493 feet long, has a 50-foot beam and a draft of 21 feet. After completion of the yard period, *McCain* will move to her new home port of Long Beach, Calif., where she will serve as flagship for Destroyer Squadron Nine.

the Tripolitan War. With two other men-o'-war, she helped silence Tripolitan shore batteries and enabled land forces to capture the city. This later proved to be the deciding action of the war.

While her predecessor was engaged in the Mediterranean, the third *Hornet* was under construction in Baltimore. This one was an 18-gun brig modeled after French warships.

During the War of 1812, *Hornet* sailed with *uss Constitution* and later captured several prizes, the largest of which was the brig *Resolution* with \$25,000 in specie aboard. Later in the same voyage, she encountered the British brig *Peacock* and exchanged broadsides for more than two hours. When *Peacock* began to founder, *Hornet's* commanding officer sent men aboard her in an attempt to keep her afloat, but the ship sank with nine of her own crew and three of *Hornet's* men.

The third *Hornet* also saw action against African slavers and Cuban pirates beginning in 1815. In September 1829, she was driven from her moorings during a storm off Tampico. Dismasted, she foundered with all hands.

The fourth *Hornet* was a five-gun schooner built at a cost of \$2200 and used primarily for dis-

patch duties and inshore patrol work.

The fifth *Hornet*, an iron side-wheel Confederate blockade runner captured off North Carolina in 1864, was the first of her name to be propelled by steam. She sailed to Havana late in 1865 to take custody of the former Confederate ironclad ram *Stonewall*, turned over by her captain to Spanish authorities at war's end, and escorted her to Washington.

The sixth *Hornet* was a yacht purchased by the Navy and converted for use in the Spanish-American war. Though armed with only three 6-pounders, two 1-pounders and four machine guns, she distinguished herself in several actions off Cuba.

In company with a squadron including gunboats *Helena* and *Wilmington*, *Hornet* attacked Spanish shipping in the harbor of Manzanillo in July 1898. In two and one-half hours of fighting, *Hornet* and company managed to sink or disable five gunboats, a harbor guardship, and three transports. During this action *Hornet* fired nearly 700 rounds and experienced no casualties.

The sixth *Hornet* was sold by the Navy in 1910, and for some 30 years the service was without a *Hornet* until the first aircraft carrier to bear the name slid down

the ways at Newport News, Va. Secretary of the Navy Frank Knox stated, "Today we are present at the rebirth of a great name in the history of the Navy."

This *Hornet* was to become more famous than any of her predecessors as her air squadrons left a trail of destruction in the early stages of World War II. Her most memorable moments came when she served as the springboard for General Jimmy Doolittle's raid on the Japanese mainland, and when she helped to stop the victorious Japanese Navy at the decisive Battle of Midway.

In October 1942, *Hornet* was badly damaged and set afire after 10 hours of fighting in the Battle of Santa Cruz. To prevent her from falling into enemy hands, she was torpedoed and shelled by U. S. destroyers before being sent to the bottom by "long lance" torpedoes from Japanese destroyers.

Less than one year elapsed before the present *Hornet* appeared on the ship's register as CV-12. And only months after she was rushed into service, she had the chance to avenge the loss of her predecessor.

On 19 Jun 1944, in the vicinity of the Marianas, *Hornet* and other ships engaged the Japanese in the Battle of the Philippine Sea. *Hornet's* planes helped stop the Japan-

ese air attack in the "Great Marianas Turkey Shoot." Aircraft from *Hornet* destroyed one of the enemy's largest carriers on the following day, scoring torpedo and bomb hits on another carrier and a cruiser. Although many of *Hornet's* planes were damaged, only one was lost.

Later that summer, *Hornet* sent search planes to within 175 miles of Honshu and cruised within 400 miles of the Japanese coast. This was believed to have been the closest approach to the Japanese mainland any U. S. surface ship had made to that point in the war.

In summary, *Hornet* and her squadrons figured in almost every major campaign in the Pacific Theater, and in the process built a remarkable record in planes destroyed, both in the air and on the ground, in naval and cargo ships sunk, in softening up such targets as Truk, Eniwetok, Iwo Jima, Luzon and Okinawa, and in assisting in the invasions of Leyte, Iwo Jima and Okinawa.

After the war, *Hornet* served as a troop transport to bring veterans back to the West Coast, and then was deactivated at San Francisco.

During the Korean conflict, *Hornet* was recalled and served in the Pacific for three years as CVA-12 before entering the yards at Bremerton. She received a seven-month streamlining which included an angled flight deck, hurricane bow, deck edge elevator and other improvements. She came out of the yards in August 1956 and then operated in the Pacific from her home port at Long Beach.

*Hornet* reentered the yards in 1958 and was converted to her ASW (CVS) capability.

She since has operated throughout the Pacific, and last summer gained fame as a space recovery ship when she retrieved the *Apollo 11* astronauts who first visited the moon. *Hornet* duplicated this feat last November after the *Apollo 12* mission.

At this writing, *Hornet* is in Long Beach to prepare for deactivation. Sometime after March, she will move to Bremerton and transfer to the inactive roster.

**GOING UP**—Preparing to launch a weather research balloon, an aerographer's mate checks to make sure all instruments are in proper working order.

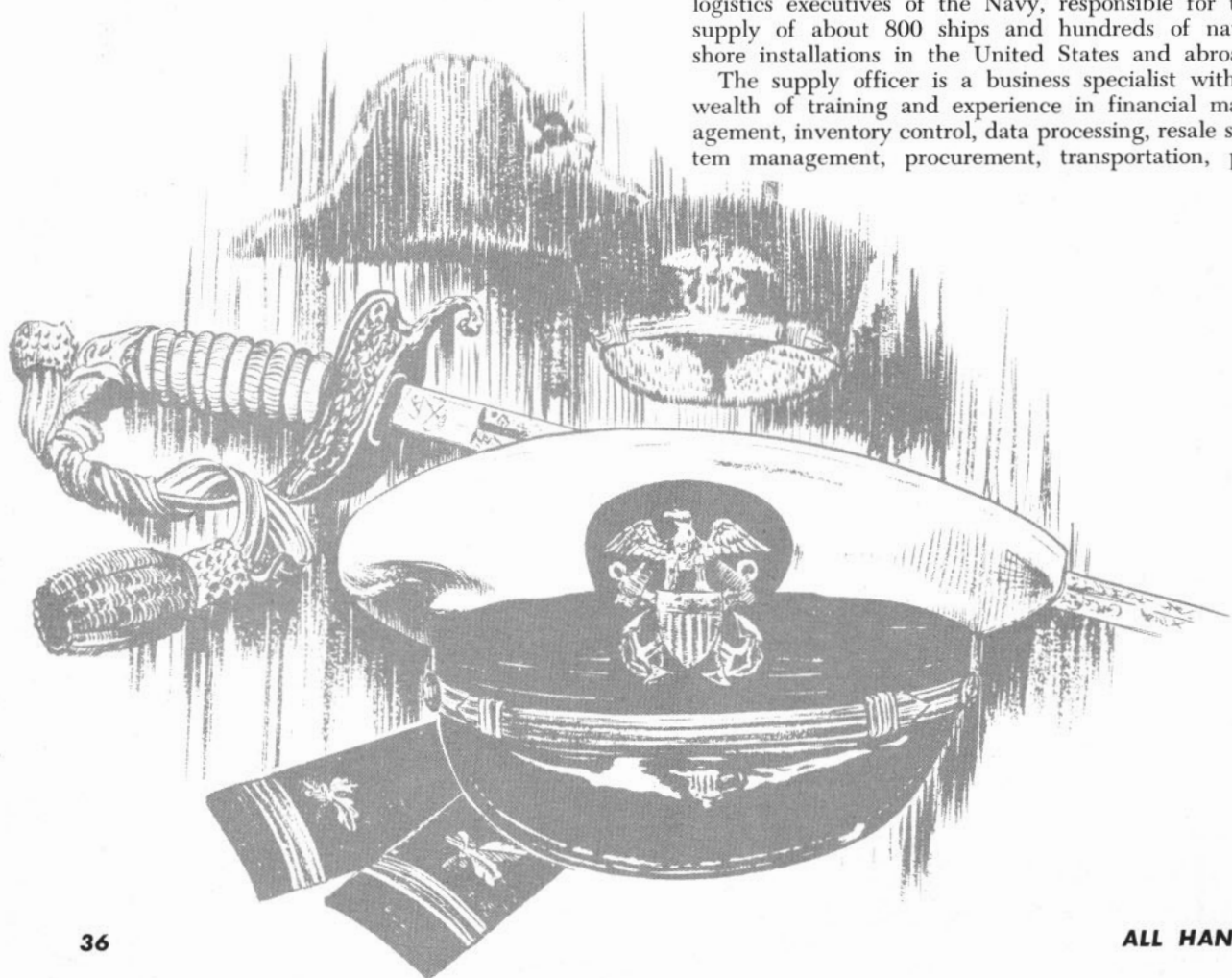


# 175th Anniversary **The NAVY SUPPLY**

**T**HE NAVY SUPPLY CORPS, having progressed from supplying cannon balls to missiles, from provisioning wooden ships to nuclear-powered vessels, celebrated 175 years of such service to the Fleet on 23 Feb 1970.

Today, approximately 5800 naval officers wear the oak leaf of the Supply Corps. They are considered the logistics executives of the Navy, responsible for the supply of about 800 ships and hundreds of naval shore installations in the United States and abroad.

The supply officer is a business specialist with a wealth of training and experience in financial management, inventory control, data processing, resale system management, procurement, transportation, pe-





# CORPS

troleum management, or in one or several of the other business management areas that spell out *Service to the Fleet*.

He may be found in all parts of the world, for there is hardly a command of consequence where his services are not needed and used—from the Antarctic Support Forces to the Pacific Missile Range. For example, supply officers are found buying petroleum in such exotic places as Bahrain and Curacao. They are also found operating the Naval Academy Dairy Farm at Gambrills, Md. But, most certainly you will find them involved in broad logistic planning as they serve in joint staffs, in the Offices of the Chief of Naval Operations, and in all major fleet commands.

Supply Corps officers command large and small shore installations in the U. S. and overseas, such as supply centers, ocean terminals and fuel depots. Additionally, cargo handling battalions—mobile units—are commanded by SC officers.

**R**EGARDLESS of where he serves, the Supply Corps officer's basic responsibility is to insure the logistic support of the operating forces. This responsibility is succinctly expressed by the Corps' motto: "Ready for Sea."

It is a far cry from the crude logistics required to support the original six ships provided in the Naval Armaments Act of 1794. From this requirement came the outgrowth of the Navy Supply Corps.

Although the Corps' formal history begins in 1795, the tradition of seagoing officers specially trained to manage the business affairs of the ship dates back to the 11th century when British agents, called clerks, were responsible for the entire fitting out of vessels in the service of the king.

These clerks were held in low repute by the crews they served, mainly because the seamen often felt they were being cheated in the purchase of necessary

items. Even today such terms as "purser's shirts," meaning a loose, poorly fitting garment, and "purser's candles," meaning the smallest possible candle, are occasionally heard in the British Navy.

**T**HE EARLY American "supercargoes" or pursers, while modeled after the British clerk, were considerably more honest. At least they had better reputations, judging from the fact that the American Navy never had to require its pursers to whistle continuously while inventorying provisions to prove they were not eating raisins which belonged in the pudding.

But the purser aboard an American fighting ship in the 18th century hardly needed to settle for raisins. The law *limited* his profits on sales of personal items for the crew to a 50 per cent markup. Items of secondary necessity brought a tidy 25 per cent, while "slops"—clothing and small stores—netted 10 per cent.

The allotment of a percentage profit to a naval officer seems strange today and was vigorously opposed by the first commissioned pursers. At the time, however, it reflected the Navy's attitude toward the purser, who was regarded as little more than a civilian given a warrant to come aboard to handle finances and subsistence.

The percentage profit system had begun when the owners of private vessels put a man they could trust aboard to look after the monetary interests of the ship. By making it in the purser's interest to cut down on expenses, the owners turned a higher profit. Naturally, the more successful the voyage, the greater the amount the purser made, as well.

When the Naval Armaments Act of 1794 was passed, it authorized one purser for each of the new ships. He was to be a warrant officer, and responsible for feeding and paying the crew and selling them clothing and small stores. He was paid \$40 a month and allowed two rations a day.

**T**HE SUPPLY CORPS was officially born in 1795 when Congress established a Purveyor of Public Supplies, thus instituting Navy procurement and supply ashore.

Tench Francis and Israel Whalen, respectively the first and second Purveyors, were essentially purchasing agents. In other words, they were responsible for procuring and providing naval stores, as well as "generally all articles of supply requisite for the service of the United States." Eventually, their responsibilities were taken over by what is the Naval Supply Systems Command today.

As the demands of the Navy increased, it became necessary to appoint additional civilian administrators for Navy supply. Therefore, in 1798 the office of Accountant of the Navy was created. Purser responsibilities increased too. They were required to have a

sword and cannon, in assisting their brethren-in-arms of the line."

Despite this reference to "brethren-in-arms," pursers faced a long, uphill fight to achieve equality with officers of the line. Much of their early history shows attempts to be treated equally.

**O**NE GOAL was reached in 1810 when pursers were given the status of commissioned officers. Along with reaching this milestone went additional purser responsibilities: to keep a record of ammunition ordered and expended, and a muster of the officers aboard ship.

Another milestone was reached in 1818, when pursers were authorized shore duty for the first time after "Pursers of the Yard" were appointed at Navy shipyards. As at sea, their primary responsibilities were to pay and feed all the officers and men, as well as mechanics and laborers. They were allowed to choose naval storekeepers to assist them.

The question of relative rank of pursers came up in 1833 when Navy Department regulations placed them below lieutenants (junior grade). But at the insistence of a group of line captains, the newly commissioned pursers were ranked with lieutenants. There the rank issue remained until 1857 when further revisions ranked pursers with more than 12 years' service with commanders, and those with fewer years' service with lieutenants.

When the Navy was reorganized in 1842, pursers gained additional status by having a home of their

Shown in this drawing is a purser directing the business operations of a ship. These gentlemen were both merchants and bankers.



Pursers, forerunners of today's supply officers, spoke French and Spanish with enough fluency to carry on trade negotiations.

speaking knowledge of French and Spanish in order to conduct business with foreign merchants, and to submit their records for regular audit by the Treasury Department.

These pursers were not expected to engage in combat, so were given battle responsibilities below deck. But as one chief gunner wrote in the 19th century, "for some years they (pursers) have been very much the combatants, in active participation with pistol,



own created. Criticism of the Board of Naval Commissioners, which had run the Navy since 1815, led to the establishment of a bureau system in the Department. One of the five new bureaus was that of Provisions and Clothing.

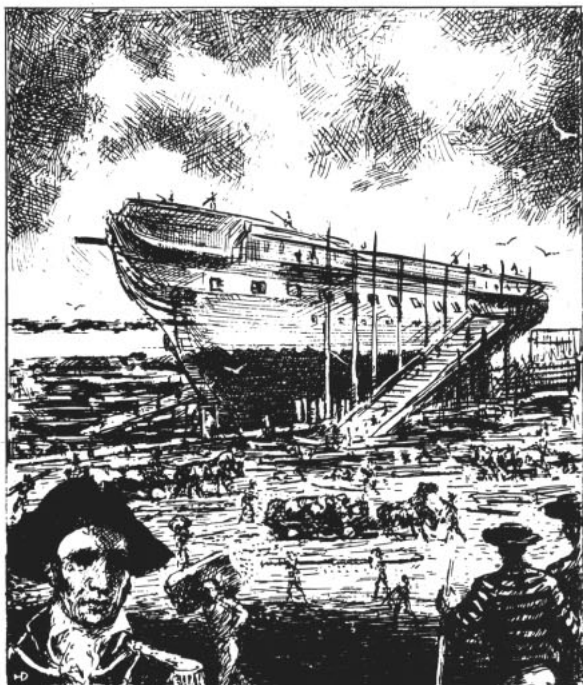
**T**HE BUREAU of Provisions and Clothing was charged with handling "all provisions of every sort, whether solid or liquid; all clothing of every sort; all labor employed thereon; all contracts and accounts relating thereto," according to regulations. So it was that after 47 years of service, the supply organization of the Navy finally became an entity in its own right.

Ironically, a civilian was appointed to head the supply bureau. He was the only non-officer to head one of the five new bureaus.

Congress debated compensation for pursers in 1842, then passed legislation that provided for a standard pay scale to replace their former rations, allowances and pay. They received between \$1500 and \$3500 a year, depending upon the size of their ship. Previously, pursers had been paid \$480 a year exclusive of rations, but the law allowed them to make a profit of from 10 per cent to 50 per cent on goods sold to the crew.

The new law also required pursers to buy their supplies with public funds, and they were forbidden to procure or dispose of supplies to the officers and crew for their own profit. Only the margin allowed by Congress could be charged, and with this legislation complaints of purser exploitation were finally laid to rest.

Attacks on American shipping by the Barbary pirates prompted Congress to authorize construction of six frigates in 1794.



**J**UST BEFORE and during the Civil War, a series of events led to greater status for the pursers. In 1858, their titles were officially changed to Paymasters, in recognition of their duty as Navy Pay Officers.

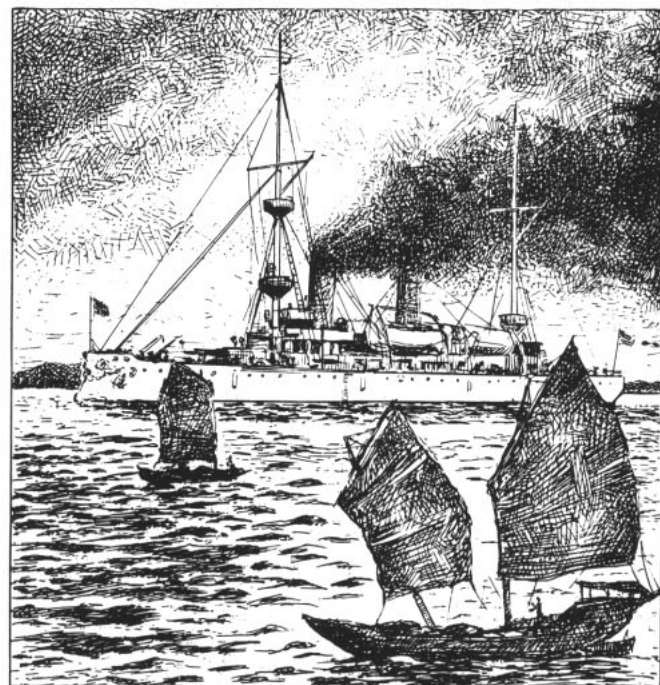
And in 1861, Congress provided that appointments to the Corps of Paymasters could be made only from the list of Assistant Paymasters. The following year legislation required that the head of the Bureau of Provisions and Clothing be a Paymaster. Finally, in 1870, a separate Pay Corps was established, headed by a Paymaster General.

More important than changes in their titles was the growth of Paymasters' responsibilities in the decades after the Civil War.

The experiences of the war made it clear that the system of making purchases ashore through civilian Navy agents, a system established in 1776, led to abuses. Hence, in 1865, the Navy agents were discontinued. Their duties landed squarely on the shoulders of the Paymaster who was now charged with the complete responsibility for supplying the Navy ashore as well as afloat. Before 1886, each bureau maintained complete control over its own purchases and their storage and issuance. This resulted in duplication and a Navy inventory far in excess of the Navy's needs.

**T**HIS PROBLEM was met with the establishment of the General Storehouse System in 1886. Stocks were consolidated under one general storekeeper at each Navy yard and station. Aboard ship, stock was con-

The flagship USS Olympia was supplied by bumboats off the coast of China before sailing into the battle of Manila Bay in 1898.





solidated in a single supply department managed by a Paymaster.

While these steps made for more efficient administration, they also increased the responsibilities of Pay Corps officers. Shortly thereafter, the Navy created the Navy Stock Fund, an appropriation used to purchase items of standard Navy stock. Each bureau was charged for an item when it was issued. Responsibility for administering the Stock Fund was given to the Pay Corps.

At the time the general stores system was introduced ashore, and shortly thereafter afloat, the Navy felt the need to reorganize its financial system to match its supply system. All accounting data was to be kept in the Bureau of Provisions and Clothing, thereby ending the previous fragmentation and making it possible to determine the total value of Navy property and the expense of maintaining it.

Property and appropriation accounting concepts were introduced by Paymaster Albert S. Kenny. Thus, the officers of the Pay Corps became the accountants for the Navy in much the same fashion that they had become its storekeepers. As a result of assuming increased responsibilities, the Bureau of Provisions and Clothing was renamed the Bureau of Supplies and Accounts in 1892.

**A**BOARD SHIP, a variety of revolutions were taking place as the 19th century ended.

Foremost among these was the end of the berth-deck messing situation, and the introduction (under the leadership of Pay Corps officers) of the general messing system. The serving of all the crew in a common mess, introduced by Paymaster John S. Carpenter aboard *uss Texas*, led to better food, improved morale, and distinctly more healthful conditions at mealtime.

In 1901, the paymaster replaced the executive officer as the officer in charge of the crew's messing, and took over total responsibility for purchasing, storing, issuing, preparing, and serving the food.

Combining ration funds made it possible to vary the Navy diet, which had changed little since the 18th century. Lamb, veal and sausage were introduced into the mess by Paymaster T. J. Cowie aboard *uss New Hampshire*. He also purchased great quantities of fresh vegetables for his crew. Central cooking also could mean central cleanup.

On board *uss Missouri*, meanwhile, Paymaster George P. Dyer introduced the first dishwashing machine, eliminating the previously accepted film of grease on cutlery and dishes. Dyer also installed the first automatic potato peeler, potato masher, ice cream mixer, dough mixer, and meat slicer—and served from the Navy's first cafeteria-style steam tables.

**T**HE SHIP'S STORE was inaugurated aboard *uss Indiana* in 1896. At first the store sold only beer, using the profits to buy additional food for the mess. But the

sale of beer created a storm of criticism among officers who, fearing a decline in discipline and efficiency, pointed out that a petty officer had been murdered aboard *Indiana* shortly after beer was first sold on board.

Consequently, the ship's store flourished not so much on the sale of beer as on such personal articles as towels, soap, candy and tobacco. Great variation among stores in merchandise, pricing, and quality of goods led the Navy in 1915 to issue regulations on these subjects. Profits from the stores were set aside to be used for the crew's morale and welfare activities, as a result, and the pay officer was given management control over the stores.

The development of underway replenishment, first demonstrated in the war with Tripoli when the ketch *Intrepid* transferred a cargo of fresh water, stock and vegetables to Commodore Preble's blockading squadron, received an impetus from the Spanish-American War. Supplying Dewey's ships in the Philippines was a significant challenge to members of the Pay Corps. Yet the logistics difficulties were met through regularly scheduled supply ships, including refrigerated ships loaded on the West Coast.

A few years later, the famous cruise around the world by the Atlantic Fleet helped refine the mobile supply system. One of the most significant developments during the cruise was the initial widespread use of "ration-dense" foods—items which store in limited space but can be reconstituted to make tasty, nourishing meals. These included dried milk and eggs, and dehydrated vegetables.

With the development of the mobile logistics force, a wide range of items stocked for retail issue meet the Fleet where directed.



**A**T THE BEGINNING of the 20th century, Pay Corps officers initiated programs which proved to be prototypes for the other military services and the entire government.

For example, Paymaster F. T. Arms wrote the first Navy cookbook in 1902, a significant contribution to standardizing meals aboard various ships. The only previous military cookbook had contained such advice as: "The presence of wormholes in coffee should not occasion its rejection . . . since they generally indicate



The most modern equipment is used in Navy galleys, bakeries and butcher shops using methods of top commercial outfits.

age, weigh nothing, and disappear when the coffee is ground."

An equally important step forward was the publishing of the *Navy Standard Stock Catalog* by Paymaster T. H. Hicks in 1914. By giving a standard stock number to every item used by the Navy, inventory record-keeping, stock accounting, and stock ordering were vastly simplified.

Soon thereafter, the government initiated plans for a Federal Standard Stock Catalog along the lines of the Navy's.

The first true cost accounting system was adopted by the Navy in 1909 and played an important role in enabling the Navy to keep adequate control over its vast capital resources.

During this same period, Corps officers were often called upon to perform a wide range of duties other than those of a routine supply nature.

As an example, a pay director found himself running the fiscal affairs of Santo Domingo in 1905. Another was for a time chief customs officer for Haiti and drew up a plan of currency reform to stabilize that nation's finances.

Domestically, a Pay Corps captain commandeered an old Mississippi River sidewheeler during the Ohio flood of 1893, and pushed a barge of supplies from Marietta to Gainesville, Ky., administering relief to stricken families along the way. Similarly, another paymaster supervised the feeding of thousands of homeless persons after the San Francisco earthquake.

**T**HE FINAL STEP giving pay officers full equality with line officers was taken by the Secretary of the Navy in 1918.

In a general order he wrote: "the uniform of any given rank in the Navy shall be identical in every respect throughout except for the necessary distinguishing corps devices; and every officer in the Navy shall be designated and addressed by the title of his rank without any discrimination whatever."

The title Supply Officer was authorized in 1913 for any pay officer appointed head of a supply department ashore. A few years later the change was extended to include afloat supply departments, and then to all Pay Corps officers. In 1919, the present organization designation of Navy Supply Corps was adopted.

Increasing demands upon Supply Corps officers between the wars pointed up the need for additional specialized training. The first comprehensive Navy Finance and Supply School was created in Philadelphia

"Pay call" is a big event to all sailors. Timely payments under conditions of global warfare were designed during World War II.



in 1934 and was, for a time, operational at Harvard University.

Today, every Supply Corps officer receives, in addition to precommissioning training, a 26-week course at the Navy Supply Corps School, Athens, Ga. There he is trained in basic Navy supply procedures.

**T**HE SUPPLY CORPS officers' specialized training proved of significant benefit when World War II broke out. The attack on Pearl Harbor touched off what was to be a battle of supply lines in both the Atlantic and Pacific.

From a relatively small-scale, decentralized operation, the Supply Corps faced a sudden transition to a centralized operation supporting the entire Fleet, the Navy's air arm and shore installations worldwide. As a result, supply facilities sprang up all over the world to sustain combat units.

Mobile logistics—far exceeding the four bullocks, one calf and assorted fowl *Intrepid* brought to Commodore Preble—became a highly organized effort to keep the Fleet replenished and underway. From about 2200 officers, of whom 1400 were Reservists, the Corps grew to 16,800 officers, including 14,900 Reservists, by the end of World War II.

It was during the war that the Supply Corps readied itself to meet the technological weapons system revolution that is taking place today in nucleonics, missiles and space. Appraisal of the Navy's changing supply needs led to the establishment of the integrated Navy Supply System, employing advanced business management practices.

This system, created by Secretary of Defense James

Forrestal in 1947, has achieved a high degree of flexibility in the control of material throughout the Navy and enables the Corps to serve the Fleet needs of today, in peacetime or war.

**C**URRENTLY, the Supply Corps is managing the extensive logistics network which supplies our fighting naval and Marine forces in the Republic of Vietnam and Southeast Asian waters. Some 250 officers are assigned in-country, running transportation facilities, paying and feeding personnel in remote areas, and supporting the Marines in over-the-beach operations.

It was Navy supply officers who helped solve the port congestion and materials handling problems brought on by the expansion of U. S. efforts in 1965.

The final organizational change important to the Supply Corps occurred in 1966 when, as a result of the Navy Department reorganization on 1 May that year, the Bureau of Supplies and Accounts was renamed the Naval Supply Systems Command. With this transition to Systems Commands, the outworn title of "Paymaster General" was changed on 13 Oct 1966 to "Chief of Supply Corps" to better describe the role of the Head of the modern Supply Corps.

Former Chief of Naval Operations, Admiral David L. McDonald, noted this about the Navy Supply Corps when he said:

"The Navy's supply establishment must maintain in a state of constant readiness the most highly mobile, most powerful sea force the world has ever known. The chore of merely replenishing our ships at sea virtually staggers the imagination, for a typical task force consumes about 300 tons of material daily.

"In recent years, the Navy has progressed from guns to missiles and nuclear warheads, from fuel oil to atomic power. The supply system has not simply kept pace with the Navy's space age weaponry; it has pioneered and blazed trails in supply management to support the space age Navy."

**L**OOKING to the future, the essential task of the Supply Corps will still be to have the right material, in the right quantity, at the right place, at the right time. To do this in any global war will be more difficult than ever, for two principal reasons.

First, the steadily increasing range and speed of Fleet operations, coupled with the immense perimeter of the potential enemy, greatly broaden the area in which support will be required. Second, scientific and technological advances bring more complex weapons systems into the Fleet, each adding a peculiar logistic support problem.

But the same dedication and imagination that have characterized Supply Corps support of the Fleet in the past will be available to meet the new requirements of the Operating Forces.

After 175 years of achievement, the Navy Supply Corps is anticipating the challenges of the future.

Providing clothing to all enlisted personnel is an important Supply Corps function shown in this shipboard issue room.





# LITTLE KNOWN FACTS

- A typical week's bill of fare in the Navy in the year 1799 left much to be desired. It read something like this: seven pounds of bread, two pounds of beef, three pounds of pork, one pound of salt fish, one quart of fish, one and a half pints of peas or beans, 12 ounces of cheese, and two pounds of potatoes or turnips.

Six ounces of molasses or one gill (four ounces) of oil could be substituted for four ounces of butter. Further lubrication was provided by the daily issue of one-half pint of distilled spirits or one quart of beer.

- Transfer-at-sea methods actually were used as early as 1804. During the war with Tripoli, for example, the ketch *Intrepid* transferred a cargo of fresh provisions to *USS Constitution* which was enforcing a continental blockade of the port of Tripoli.



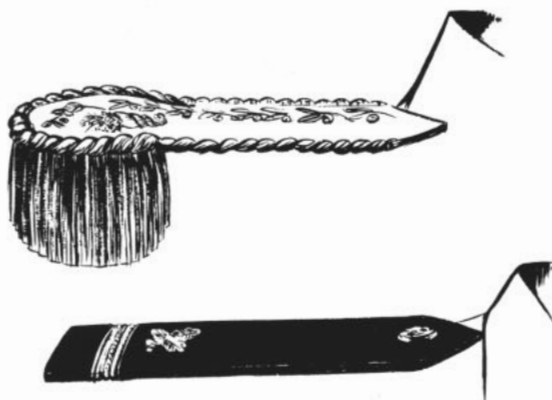
The cargo included four bullocks, one calf, 13 pigs, 300 pounds of hay, two baskets of peas, and three casks of old Hock.

This maneuver was the springboard for the modern, mobile logistical support now provided through underway replenishment which enables the Fleet to remain at sea almost indefinitely.

- The forerunner of today's Supply Corps insignia—the oak leaves and acorns—was the cornucopia, or horn of plenty. It became the mark of the supply specialist in 1830.

The use of the oak leaves and acorns as a decoration of the Navy uniform was also introduced that same year; however, it wasn't until 1841 that the strip of live oak leaves and acorns replaced the cornucopia on the collar of the full dress coat.

Reason for the oak leaf as a symbol for the Supply Corps is lost somewhere in naval history.



One explanation suggests that oak was once the main source of building our early fleet.

Another points out that the oak tree has been a constant symbol of strength and sturdiness. In either case, the oak leaf is the standard of the logistical support arm of the U. S. Navy.

- A most interesting method of solving a World War II supply problem was devised by the Navy Supply Corps. A shortage of binoculars, telescopes and spyglasses was created when foreign sources were cut off.

An appeal was made to U. S. citizens to furnish "Eyes for the Navy." As a result, 51,217 instruments



poured in, of which 31,000 were suitable for use aboard naval ships. The owners received a letter of thanks from the Assistant Secretary of the Navy and a \$1 sales or rental check.

Each instrument retained by the Navy had a serial number engraved upon it and a permanent record was kept describing it. When the war ended, they were returned to the owners, along with a brief history of where the instrument saw action.

## SUPPLY CORPS SCHOOL

# Through These Portals

**E**ACH YEAR approximately 600 ensigns are commissioned in the Navy Supply Corps from three primary sources of talent: the Officer Candidate School at Newport, R. I. (70 per cent); Naval Reserve Officer Training Corps units at colleges and universities throughout the United States (25 per cent); and the United States Naval Academy (5 per cent).

Applicants are accepted from almost every academic background. For instance, about 15 per cent have degrees in economics, 16 per cent in hard science, 19 per cent in liberal arts, and about half of the applicants are business administration graduates. Over-all, nearly 20 per cent of the Supply Corps ensigns hold advanced degrees.

In addition to business majors, the Navy needs Supply Corps officers with backgrounds in mathematics, engineering, the physical sciences, personnel administration, and the humanities.

First and foremost, regardless of his specialty, the Supply Corps officer is a naval officer with military responsibilities. Through each officer program, those commissioned in the Supply Corps receive the same basic training as their unrestricted line officer counterparts. After commissioning, SC officers, regardless of previous training or experience, are ordered to the Navy Supply Corps School in Athens, Ga., where for six months they develop the skills and techniques required in the management of Navy men, money and material.

**E**VERY Supply Corps officer must complete the basic qualification course at the Navy Supply Corps School. The curriculum, which emphasizes shipboard operations, has been carefully designed to prepare officers for the challenging role of managing a supply department aboard ship. For this reason, more than 95 per cent of the officers report directly to sea duty upon graduation from Navy Supply Corps School.

The NSCS academic workload is demanding as well as challenging. Officers attend approximately

20 hours of class each week and, in addition, are assigned a substantial amount of work to be completed outside of class. Training methods are the most modern available, and course material is kept current through close liaison with Fleet staffs and recent NSCS graduates.

The instructors are officers who, having recently served aboard ship, are able to prepare inexperienced officers for the problems which will confront them in their first shipboard assignment.

Classroom lectures and discussions are related to specially prepared textbooks. Realistic problems and actual case studies also play an important part in each course.

It is recognized by the staff that there are seldom standard answers to logistic problems. Therefore, the school, while stressing theory and fundamentals, provides an environment for officers to develop the ability to analyze problems and create workable solutions. Consequently, officers must explain and defend their decisions in the classroom just as they will be required to do on board ship.

**W**HILE PRIMARY emphasis is on candidates and practical training at NSCS, the recreational facilities and wide range of student activities create an atmosphere much like that of a small college.

Officers are kept closely attuned to the military way of life, however, with morning formations, musters, watches and inspections. At NSCS, students are never allowed to forget that they are naval officers preparing for important shipboard jobs.

They never forget because each student assumes the role of one Ensign William B. Ellis, SC, USN, a fictitious supply and disbursing officer aboard USS *Duarte* (DD 901), a fictitious destroyer in the Pacific Fleet.

Throughout the 26-week course, each officer lives this role as he provisions the ship, pays the crew, manages inventories, and above all, learns to be an effective leader of men.

In the process, the student officer studies Supply Management, Disbursing, Food Service and Retail Operations, Computer Training, Personnel Administration and Assignment Orientation.

A supply officer's most important responsibility aboard ship is to provide the equipment and material necessary to maintain combat readiness. The NSCS Supply Management Course prepares the officer for this task with a thorough background in the techniques of financial and material management.

The course emphasizes the fundamentals of procurement, storage, inventory control, and the budgeting of funds. Realistic problem exercises condense months of shipboard experience into weeks of classroom work. The supply officer who completes this course should have the technical background for managerial decisions aboard almost any ship.

**N**SCS also prepares each Supply Corps officer for assignment to a disbursing billet at sea, either as primary duty on a large ship or in conjunction with other phases of supply on a smaller ship.

The Disbursing Course covers the maintenance of pay accounts and miscellaneous transactions such as travel pay, special allowances and the payment of merchants in foreign ports. The role of the shipboard disbursing officer is primarily that of auditor and supervisor, but it is essential that he first understand all basic financial concepts and operations.

Fundamentals are introduced through comprehensive problems covering transactions common to every disbursing operation. Students are then prepared to study and use the audit procedures necessary to control the large sums of cash which will cross their desks each year.

The management of food, including its preparation, and the management of ship's stores and such servicing facilities as barbershops, laundries, soda fountains and vending machines are the responsibility of the supply department.

At NSCS, the Food Service and Retail Operations Course—divided into two sections—is designed to train supply officers to be effective managers in these areas.

The Food Service segment concentrates on menu planning, food preparation, procurement, inventory control, and financial management. While the supply officer does not become a qualified chef through this course, he nevertheless will be qualified in the management of a food service operation.

The Retail Operations portion deals with the techniques of operating a successful shipboard business and the management of the service activities. In addition to classroom work dealing with financial controls, stock levels, operating procedures, and merchandising techniques, a vending machine, fully operational laundry, and a modern ship's store are located in the school's training building. These training aids afford officers an opportunity to see firsthand the type of facilities they will soon manage aboard ship.

**N**O SUPPLY CORPS officer can be considered fully qualified until he understands and can utilize the methods of modern management.

Therefore, the NSCS Computer Training course introduces the student officer to the Navy's expanding computerized systems of supply management and provides a background in computer fundamentals, capabilities, programming and management.

In addition, there is an advanced computer course, available on a voluntary basis, for officers who qualify.

All students have an opportunity to use a modern computer system identical to those found on the Navy's larger ships. Each graduate leaves the Computer Training course with the ability to apply this essential tool to his management problems.

Almost every Supply Corps officer will be a division officer at his next duty station. As such, he will be responsible for the morale, performance and professional development of from 25 to 100 or more men. To better prepare him for this undertaking, the Personnel Administration Course concentrates on effective manpower management.

Here, the Supply Corps officer develops his own approach to leadership, based on subjects ranging from career development, military customs and courtesies, and social responsibilities, to the collateral duty assignments traditionally associated with duty as a Supply Corps officer.

**W**HEN THE STUDENT officer enters his final two weeks of training at NSCS, he commences to cross the Assignment Orientation bridge, the last link between being a student officer and becoming a full-fledged supply officer.

During this time he will study the operational environment of the particular ship to which he has been assigned.

As a final preparation, each officer is presented with an integrated management problem representing a supply officer's typical day aboard ship. This last phase of the NSCS curriculum enables the Supply Corps officer to become an immediate producer in his new job.

Graduation ceremonies mark the completion of formal training. From Athens, Ga., Supply Corps officers



go to duty stations throughout the world with the knowledge that the foundation they received at the Navy Supply Corps School has prepared them and made them *Ready For Sea*.



# bulletin board

## *Navy Transient Lodges Get Underway*

**A**SK ANY married Navyman: what's the first and most expensive problem that comes up when he arrives at a new duty station?

Nine times out of 10, he'll answer without a moment's pause. The big hassle is finding a place for the wife and kids to stay that first night—and for the days (or weeks) afterward while the family is house-hunting or waiting for Navy housing.

In the next year and a half, the Navy is planning to spend \$10 million to solve that problem for families transferring to 10 major CONUS activities by building about 875 new motel-style temporary family lodgings.

And after that first phase is finished, the Navy is scheduling more construction — \$2 million worth every year — until all the major U. S. bases have enough temporary housing to fill their needs.

Each unit will house a family of four. Larger families may be able to check out rollaway beds from the management, or rent two units with a connecting door.

The rooms will look like motel rooms, with wood paneling, draperies and wall-to-wall carpet. They will include kitchenettes to save the guests the extra expense of eating in restaurants.

A standard rent — probably about \$8 a day — will be charged for all units. (A commercial hotel or motel usually costs \$20 or more for a family of four.)

No tax money will be used in the project. It will be financed by a loan from recreation funds. Rent

paid by guests will be used to repay the loan, pay operating expenses and build more units.

**I**N RECENT YEARS the temporary housing problem steadily grew worse. Civilian hotel costs climbed, but the Navyman's only alternative was to use one of the few guesthouses managed by the Navy Resale System Office on base. NRSO did not have enough money available to build new guesthouses, and was often forced to use excess or substandard government buildings.

The Navy Department recognized the problem and went to work. First it asked the commandants of naval districts and training commands how many temporary housing units were needed in their areas.

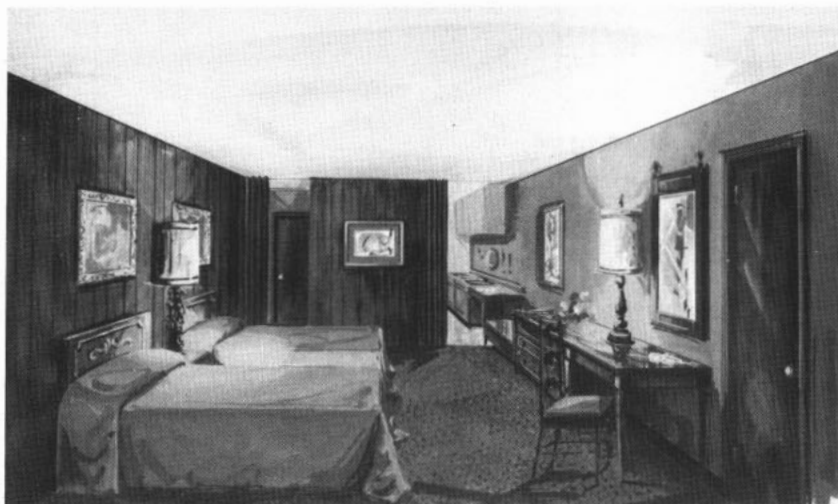
Experts in the Department then considered this information along with other factors, such as the number of Navy men in each area, existing guesthouses, the cost of commercial lodging, the average number of transfers a year, and the number of families on the waiting list for Navy housing.

With all these circumstances considered, the following 10 areas were given first priority in the initial phase of the building program, scheduled to be completed sometime next year:

San Diego, 200 units; Norfolk, 200; Newport, 125; Alameda, 75; New London, 75; Long Beach, Charleston and Lemoore, 50 each; and Mayport and Key West, 25 each.

After the first phase, the Navy will continue build-

A view of the interior as seen from the front entrance looking toward the kitchen and bath.



An artist's conception of the modern design.



ing units wherever they are needed, for as many years as it takes to fill the needs. Money for the new construction will eventually come from the rent paid at existing units.

First priority for reservations at the temporary housing will go to Navy enlisted men and junior officers with families who are arriving in or leaving the area on permanent-change-of-station orders. Any question of priority will be settled in favor of the Navyman for whom commercial lodging would pose the greatest hardship.

Transfers will be easier for Navy families because of the new lodging program — another multimillion-dollar proof that the Navy does take care of its own.

### Some Career Navy Divers May Be Eligible for Pro Pay Up to \$100

If you're a diver and a career Navyman, you may now be eligible for pro pay.

Change 2 to BuPers Inst. 1430.12I provides that career-designated men (in any rating) may receive proficiency pay in the indicated amounts if they hold these NECs:

Master diver (NEC 5341) and saturation diver (NEC 5311)—\$100.

Diver, first class (NEC 5342) — \$50.

To be eligible for the extra pay, you must meet the qualifications prescribed by the instruction. Among other things, you must:

- Be a career petty officer on active duty (other than active duty for training). "Career" means that you have served, or are obligated to serve, seven or more years' active duty.

- Be recommended for pro pay by your CO.

- Have completed at least 21 months of active service, which must be continuous if it includes any period of active duty for training. Service in any branch of the armed forces counts.

- Have at least six months' continuous active Navy service immediately before the award of pro pay. (If

you are discharged and reenlist within 90 days, you're still eligible.)

- Be serving in a billet identified by the skill for which the pro pay is authorized.

Other provisions and requirements, with a list of eligible ratings and skills, may be found in the instruction. For a detailed review of the pro pay system, see **ALL HANDS**, April and June 1969.

### Volunteers for Vietnam Are Needed, Especially in Vietnamization Program

**E**NLISTED NAVYMEN are needed in Vietnam—and will be for some time to come. About 30,000 are in-country or on non-rotated ships there now; some 2000 are rotated in or out every month.

Especially needed are advisors to the Vietnamese navy, who can teach RVN sailors maintenance and use of the craft and equipment which the U. S. has transferred to our ally.

So you can still expect many benefits if you volunteer for Vietnam duty—and a couple of extras, if you are a PO2 or above with experience as an advisor or in riverine warfare, and you volunteer for a second tour within three years of your first one.

Here's what you can expect if you're assigned to an in-country tour in Vietnam, or duty on board a non-rotated ship based there:

- Preference in consideration for reassignment after your tour.

- Hostile fire pay of \$65 a month (or part of a month, if six days or more).

- Exemption of all your pay—including reenlistment bonuses—from income taxes.

- Special non-chargeable 30-day leave and free transportation to and from anywhere in the Free World, if you extend your Vietnam tour by six months or more. (This applies to men assigned in-country or on certain designated non-rotated ships.)

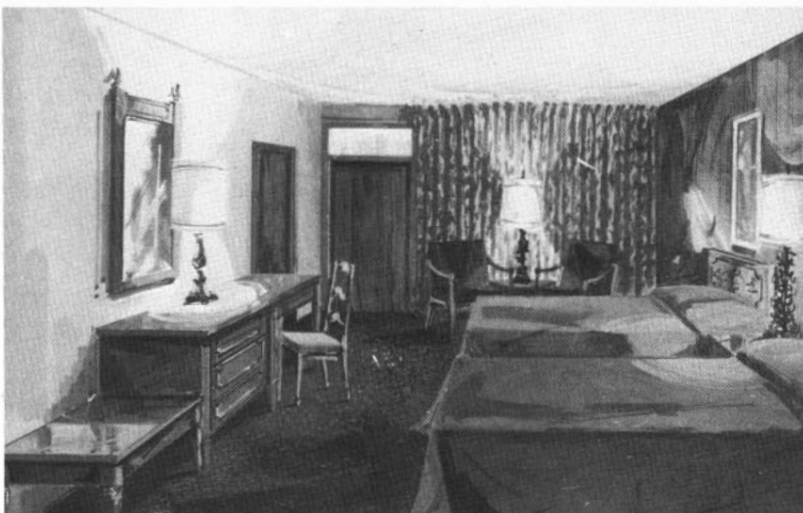
- Ten per cent interest on savings deposits.

- Transportation of your family and household

planned for the Navy's temporary lodging.



Another interior view looking toward the front entrance from the kitchen area.



## bulletin board

goods anywhere in CONUS — or, with approval of the Chief of Naval Personnel, to Puerto Rico, Alaska, Hawaii, or any territory or possession of the U. S. — subject to *Joint Travel Regulations*.

- ◆Field advancement (for men assigned in-country).
- ◆Authorized accumulation of up to 90 days' leave.
- ◆Free mail and special customs privileges.
- ◆The Vietnam-Service Medal and the Republic of Vietnam Campaign Medal with device.

If you're a PO2 or above, with experience in riverine warfare or as an advisor, and you volunteer for a second Vietnam tour within three years of the end of your previous tour, you are eligible for the above benefits, plus two other very attractive goodies:

◆Your second one-year tour counts double. It will be computed as two years' sea duty for rotation purposes.

◆You will be given even higher priority for reassignment to the home port of your choice after your tour. In fact, you will be guaranteed assignment to any of these five areas if you choose it for your next home port: New England, Middle Atlantic, Southeast, Southern California, or Hawaii. If you're Seavey eligible, you will be given preference in assignment to the naval district of your choice.

And if you want an especially challenging and satisfying assignment, you might consider requesting duty as advisor to the Vietnamese navy. The process of Vietnamization — giving the Republic of Vietnam greater responsibility for combat operations — has created a need for advisors in all areas of naval operations. An advisor assignment can be not only a challenge to your technical skills, but also a good chance to get to know the people of another country.

Now for the rules on volunteering.

A volunteer for general Vietnam duty must be male, on active duty, at least 18 years old, in pay grade E-2 or above, with at least six months of naval service before he submits his request.

He must have at least 16 months' obligated service before he is transferred from his present duty, or must extend to the required obligated service. He must pass a physical, and be recommended by his commanding officer as having good character and technical skill.

If you want to volunteer for duty as an advisor, you must meet the above qualifications, except that you must have 18 months' obligated service rather than 16. You must also be a highly motivated, mature petty officer with proven strong leadership qualities, high moral courage, and well developed, quick and sound judgment.

Men from all ratings will be considered for general Vietnam assignment. However, men from the following ratings are especially needed: BM, QM, SM, RD, GMG, ET, RM, YN, PC, PN, SK, DK, SH, CYN, DP, CS, MM, EM, EN, DC, SF, EA, CE, EO, SW, CM, BU, UT, DT, and HM.

For advisor duty, PO2s and above in these ratings are needed: BM, QM, SM, RD, TM, GMG, MN, ET, RM, EN. Qualified PO2s and above of other ratings will



A water color by John Steel depicting U. S. Navy men aboard their river patrol boats.

be considered for billets not requiring specific ratings.

All men ordered in-country will receive three weeks of special training.

Most volunteers ordered to advisor duty will take either a 13-week counterinsurgency course at the Naval Amphibious Base, Coronado, or a 17-week counterinsurgency and riverine warfare course at the Naval Inshore Operations Training Center, Mare Island. Both courses include six weeks of Vietnamese language instruction.

Some qualified volunteers will be given longer language courses — up to 47 weeks — at Washington, D. C., or Monterey, Calif.

You may volunteer for Vietnam duty with a letter to the Chief of Naval Personnel via your CO and EPDO. Details on applying, and a sample letter, are in BuPers Notice 1306 of 14 Jan 1970.

### Here Are Rules for Family Members Concerning Combat Duty Deferments

**E**VERY AMERICAN man must help defend his country. But no one family should have to carry too much of the burden.

For this reason, the Department of Defense will allow you to request a deferment from combat-zone duty if a member of your immediate family has died, has been captured, is missing in action, or has suffered complete disability as a result of service in a hostile-fire zone since 1961.

Two major changes in the policy on family deferments were made late last year.

Service in a specified part of the Republic of Korea now counts as duty in a hostile-fire zone for deferment purposes, as in-country Vietnam service does.

And a Navyman may now be deferred if a member of his immediate family has suffered complete physical or mental disability as a result of duty in a hostile-fire zone. Under the previous rules, only the death, capture or designation as missing in action of a family member could make a man eligible for deferment.

As they stand now, here are the rules on combat



duty deferments:

If a member of your immediate family died, is in a captured or missing-in-action status, or has been 100 per cent disabled as a result of serving in the Republic of Vietnam or another designated hostile-fire area on or after 1 Jan 1961, you may on request be exempt from serving in a hostile-fire area. If you are now serving in a hostile-fire area, you may be reassigned on request.

Your immediate family is defined as including your parents, spouse, children, brothers and sisters. Half-brothers, stepbrothers, and adopted brothers are included, as are half-, step- or adopted sisters.

Another term that requires a definition is "serving in a hostile-fire area." It means shore duty in the Republic of Vietnam; service aboard a nonrotating unit based in Vietnam and operating inshore; assignment as a member of an aircrew (whether it is based ashore or afloat) normally engaged in combat missions and based in Southeast Asia; or duty in the area in the Republic of Korea that has been designated as a hostile-fire zone.

Only service on or after 1 Jan 1961 counts for a deferment; for instance, if your father was killed in the Korean conflict, his death does not exempt you from combat-zone duty unless you are now the sole surviving son of the family.

An exemption from duty in a hostile-fire zone applies only to the types of duty listed above. It does not exempt you from service on a ship or other unit which deploys to the waters off Vietnam on a rotating basis. If, for example, you are assigned to a carrier or cruiser that makes regular cruises to the Gulf of Tonkin, the death of a family member in Vietnam does not give you the right to apply for a transfer—unless, again, the death makes you the sole surviving son.

Here are some other provisions for deferments from combat-zone service:

- If a member of your immediate family (as defined above) is serving in the Republic of Vietnam and you receive orders to in-country Vietnam service, you may request postponement of your transfer until the other family member's tour has ended. (This applies only to Vietnam, not to Korea or other areas.)

- If you are under 18 years of age, you will not be assigned to a hostile-fire area. You may, of course, be assigned to sea duty or to other overseas shore duty.

- If you are the sole surviving son of your family, and if your father or one or more of your brothers or sisters has died, has been captured, is missing in action, or is completely disabled as a result of U. S. military service, you may request assignment to non-combat duty, or in certain cases you may receive an administrative discharge. Detailed information on this provision is in Article 1860100 of the *BuPers Manual*.

- A conscientious objector may request noncombatant duties. However, unless he qualifies for exemption for one of the other reasons mentioned above, he may be assigned to a hostile-fire zone, even though he will not be required to use weapons.

If both you and another member of your immediate family are serving in the Republic of Vietnam, the one who has served longest in Vietnam will receive priority in consideration of his request for deferment.

Anyone who has been assigned a limited duty classification (for example, a sole surviving son) must request specific authorization from the Chief of Naval Personnel before he may reenlist, extend his enlistment, or otherwise obligate himself for further active duty. Conscientious objectors may not reenlist after their first term of service expires.

If you are eligible for deferment from combat-zone service but do not want your assignments limited to noncombat areas, you may request that the restriction be removed.

For more details on combat-zone deferments, see BuPers Instruction 1300.38B.

### Unique Training Is Offered Navymen At Fleet Sonar School in Key West

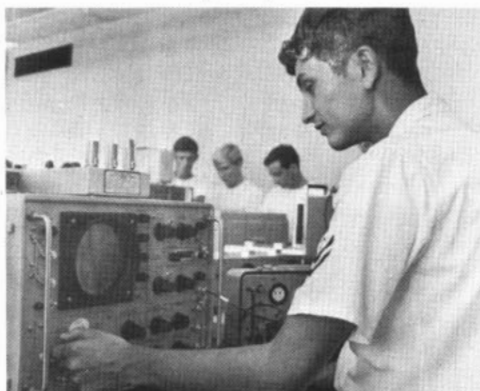
**D**ETECTING enemy submarines in war and peacetime is one of the Navy's primary jobs. Hundreds of sonar technicians and antisubmarine warfare officers must be trained each year to operate and maintain sophisticated underwater sound detection equipment used on board ships to locate these submarines.

Part of this training is done at the Navy's Fleet Sonar School in Key West, Fla., where officers and enlisted men learn tactical aspects of antisubmarine warfare as well as operation and maintenance of the sonar and fire control equipment.

Located on the Naval Station at the island's southern edge, Fleet Sonar School's \$17-million, four-building complex is staffed by more than 350 officers and enlisted men.

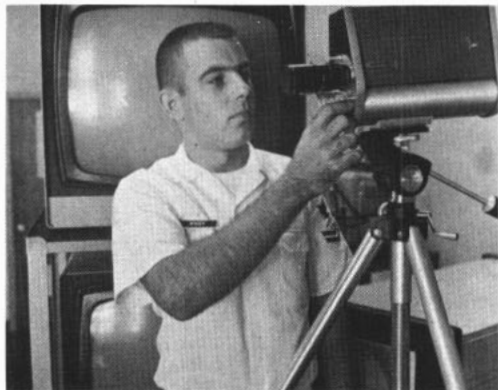
Besides training U. S. Navy personnel, the school every year integrates into various courses more than 100 officers and men of allied foreign Navies. They come from the Far East, Middle East, Europe and all over the Western Hemisphere to study all aspects of antisubmarine warfare. More than 50 nations are eligible to participate in the training program.

**TEST TIME**—Test equipment is used in advanced electronics laboratory at the Fleet Sonar School, Key West, Fla.



## bulletin board

Because of this foreign training program, Fleet Sonar School staff members often find themselves doubling as goodwill ambassadors. They accept responsibility for showing these allies the American way of life, besides teaching them about sonar and anti-submarine warfare.



**TV TEACHER**—Closed circuit TV is prepared for classroom use at Fleet Sonar School.

**T**HROUGH special tours, visits to local, state and national government offices, courtrooms, schools and churches, the foreign nationals learn firsthand of this country's social, cultural, industrial and political institutions as well as its potential for supporting international commitments. Locally, for instance, they visit Key West's newspaper office, a desalination plant which produces fresh water from seawater to serve the town's needs, and Florida Keys Junior College. Some officer students also travel to New York City and Washington, D. C. This week-long trip is included in the schedule of a 10-week course they undergo at Fleet Sonar School.

Experience which foreign nationals get this way extends their education by showing them realistically how our nation and its citizens function. The whole ambassadorial program helps promote the United States' foreign policies, security and general welfare and shows foreign nations how this country can help them improve their own economic development and internal and external security.

The enlisted foreign students are integrated into two of Fleet Sonar School's training departments—Surface-Airborne Sonar Training, and Special Training. The officer Training Department teaches a special foreign officer course. The largest department in Fleet Sonar School, Surface-Airborne Sonar Training, teaches nearly 75 per cent of the 3000 enlisted students graduated each year. It includes Class "A" schools, which stress basic electronics theory and equipment operation, and Class "C" schools, which teach maintenance of sonar and fire control equipments. The Officer Training Department, with courses ranging in length from one to eight weeks, annually graduates most of its students in a basic antisubmarine warfare officer course. The inexperienced junior

officers who attend these classes learn shipboard responsibilities of an ASW officer, such as coordination of ASW weapons systems, supervision of equipment maintenance and repair, and search and attack procedures used in ASW operations.

The Submarine Training Department trains selected enlisted men who have volunteered for duty as sonar technicians in any of the Navy's modern submarines. Courses consist of basic, advanced and functional maintenance of all types of submarine sonar equipments. Upon graduation, these men attend Navy Submarine School in New London, Conn., for specialized training. After that they are assigned to operational submarines.

Coordinating all course materials, instructional methods and examinations is Fleet Sonar School's Standards and Curriculum Division, a part of the Training Support Department. Composed primarily of master and senior chief petty officers, with years of experience at sea with all types of sonar and fire control equipment, this division was created to ensure that all material taught at Fleet Sonar School actually helps Navy men perform their jobs more effectively at sea.

### Services and Benefits Council Is Set Up by CNO As a Retention Measure

**R**ETENTION is a subject that is very much on the minds of Navy officials at times when there is keen competition on all sides for good men. This is one of those times.

Incentives such as reenlistment bonus and guaranteed service school may be enough to sway some men to ship over—but what is even more important is positive action to improve the ordinary things that affect Navy men day after day after day. They include job satisfaction, working conditions, living conditions, person-to-person communications—and morale.

Retention is a subject discussed by the Chief of Naval Operations in OpNav Notice 1700 (29 Dec 1969).

And hereafter, says CNO, there will be a Services and Benefits Council to help ensure that "all programs bearing on the life and service of each Navyman and his family make a positive contribution to career motivation."

Essentially, the directive recognizes that almost every activity the Navy conducts has some influence on Navy men and families. It stressed that every aspect of service life over which the Navy has influence should be managed, or "thoughtfully coordinated," to make the Navy more attractive as a career.

At the local level, where the individual Navyman is actually affected by policies and practices, the Services and Benefits Council will be the "coordinating device."

In summary, here's how this new program will get underway:

#### Council Establishment

It is anticipated that individual Services and Bene-

fits Councils will be established at port locations with a concentration of Fleet and shore-based Navymen who belong to more than one command. For example: Guantanamo Bay, San Diego/North Island, and Norfolk/Little Creek/Portsmouth.

Also, councils may be established at naval stations, naval air stations and naval shipyards not located within large groupings.

For immediate impact and long-range benefit, early adoption of councils by as many major or isolated commands as possible is strongly encouraged.

A flag officer from a fleet command will normally be the council's chairman. Commanders with appropriate staffs may designate flag officers to act as chairmen for the council meetings.

Members of a council should be representatives of key functions and services provided in the area, and each will be someone in authority who can make commitments for action.

The makeup of council would normally include the senior officer present or his senior representative, plus the career motivation officer and senior enlisted advisor:

Membership would also include personnel representing the following areas—which give an idea of the scope of the Services and Benefits Council:

- Fleet commands in the area and their career motivation officers.

- Personnel.
- Disbursing
- Housing.
- Commissary.
- Exchange.
- Hospital or dispensary.
- Education and training support center.
- Education services.
- Career information center.
- Special Services.
- Public affairs.
- Family Services Center.
- Law center.
- Chaplain.
- Project Transition site.
- Local Navy credit union.
- Wives organizations.
- Navy Relief.
- Red Cross.

#### Council Objectives

In the words of the OpNav notice, the function of the Services and Benefits Council is to coordinate . . . "new ideas, potential incompatibilities, and service problems, which when dealt with independently in the various commands and activities may be less than fully effective or even counter-productive."

The functions of shore activities which affect career motivation, commissary, exchange and dispensary, for example, should support the career counseling and retention efforts of the operating forces.

Some specific objectives:

- Ensure that programs which have a bearing on the life of Navymen support or at least complement each other.

- Create visible actions in career motivation which support career counseling.

- Provide an information link between local commanders and members of the council.

- Coordinate efforts to enhance the position and participation of Navymen in the civilian community.

- Find ways to make the Navy more attractive to the Navy wife.

- Give wives visible evidence of concern for their welfare, and increase their sense of participation in the Navy family.

- Ensure that voluntary services provided by wives are supported at the command level.

Regarding the latter points, the directive recognizes that Navy wives have considerable influence on career motivation. If a council is to succeed, it must motivate the Navy wife as well as the Navy man.

#### Meetings

How often a council should meet and how formal it will be is decided by the convening officer, based on problems peculiar to the area.

Ideally, a council meets as often as necessary to take positive action. However, it is noted that in areas with large Navy concentrations, a council may not find it feasible to meet more than four times a year.

Other details on the Services and Benefits Council program are contained in OpNav Notice 1700 (29 Dec 1969).

A Second Class Aviation Ordnanceman raises his right hand and takes his reenlistment oath for another tour of duty.

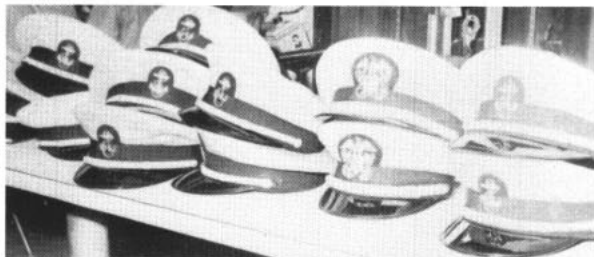




## bulletin board

### Some Enrollment Procedures Changed For NROTC College Programs

Certain enrollment procedures have been changed for the Regular Naval Reserve Officer Training Corps (NROTC). Also, beginning with the 1971 school year, it will be known as the NROTC College Scholarship Program.



Here's some basic information for aspirants wishing to become among the 1700 selected candidates.

The scholarship consists of a four-year subsidized college education during which the Navy pays tuition and associated fees, provides textbooks and midshipman uniforms, and pays the student a \$50 per month subsistence allowance to help defray the cost of room and board.

Applicants must be high school graduates or seniors who are at least 17 years of age but who will not have reached their 21st birthday by 30 June of the year they plan to enroll in the program.

An estimated 20,000 young men will apply for the 1971 program. Their selection will be considered on the basis of scores obtained on one of two aptitude tests. These are the Scholastic Aptitude Test (SAT) offered by the College Entrance Examination Board, Princeton, N. J., and the American College Test (ACT) written by the American College Testing Program facility in Iowa City, Iowa. The Navy College Aptitude test (NCAT), previously used in the NROTC selection process, has been discontinued.

Between now and 31 Dec 1970, applicants for the 1971 program should make arrangements with the appropriate testing facility to take either the SAT or ACT examination, at their own expense. Students desiring to participate in the NROTC College Scholarship Program must apply between 1 April and 1 Dec 1970, in accordance with the 1971 *Bulletin of Information* which will be distributed to the Recruiting Service in April.

Inasmuch as applications must be received by 1 Dec 1970, applicants are urged to arrange to take either the SAT or ACT on testing dates before the December 1970 test dates. Scores from the December 1970 test dates may be used if received early enough; however, there is no guarantee that December scores will be received in time to allow for processing.

Students who wish to compete for this scholarship should contact their high school counselor, the nearest Navy Recruiting Station, or write to the Chief of Naval Personnel, Pers-B6411, Department of the Navy, Washington, D. C. 20370, for a brochure and application blank.

### Better Check Your SGLI Policy Beneficiary May be a Surprise

Life insurance policies, like most other things should be reviewed periodically to make certain they provide a degree of financial security for the beneficiary you designate. But do you know who your beneficiary is?

In most commercial and some government policies, the beneficiary is specifically named. This procedure, however, is not followed in Serviceman's Group Life Insurance (SGLI).

Unless otherwise specified, these policies are automatically paid to the deceased serviceman's: widow; if no widow survives, to the child or children in equal shares; if there are no children, to the serviceman's parents in equal shares; if no parents, a duly appointed executor or administrator of the insured's estate; or, if no executor or administrator has been designated, to other next of kin.

If you are participating in SGLI and your intended beneficiary doesn't fall within the established order of payment, you should file a beneficiary designation form.

If, after once designating a beneficiary, you want to come under the automatic beneficiary provisions of SGLI, obtain a VA Form 29-8286 and, in the space designated for the beneficiary's name, write "Cancel prior designation."

Those who wish to make a new specific designation of beneficiary should file a new VA Form 29-8286.

Remember, you only really need to have a specific designation of beneficiaries if you want insurance proceeds to pass in a manner other than as provided by the law.

### Free Auto Tags Offered for Alabama Residents Serving on Active Duty

Here's a new fringe benefit for residents of Alabama: free automobile license tags.

As might be expected, there are ifs involved. These are listed in SecNav Notice 5840 (19 Dec 1969).

You may receive the free auto tag if you:

- Are on active duty in the U. S. Armed Forces.
- Entered active service from Alabama.
- Were a resident of Alabama at the time you entered the service.
- Are a resident of Alabama at the time you claim the free tag.

You generally are considered a resident of Alabama if you are domiciled there or claim the state to be the true, fixed and permanent home to which you intend to return.

Your absence from the state under military orders does not alter your status as a resident.

If otherwise eligible, you need not be physically present in the state to apply for the free license tag. A letter of certification from your Commanding Officer or Personnel Officer will suffice as proof of your residency. The letter should accompany your application for the free tag, and should be addressed to the license commissioner of your home county.

## Quals, Assignment Procedures Revised For Officers in the Nuclear Navy

**B**UPERS Instruction 1540.40C has made several policy changes regarding qualification and assignment of officers in the nuclear propulsion program. The changes provide for:

- Elimination of the requirement to serve six months as an engineering department division officer just before the engineer officer exam.
- Reduction of the minimum number of engineer officer exam candidates for each nuclear ship to one a year.
- Recognition of the course for prospective engineers offered by submarine force commanders.
- Earlier identification and longer-range programming of engineer officer exam candidates.
- Clarification of requirements for taking the pre-XO reactor safeguards exam.
- Qualifications for nuclear trained warrant officers and LDOs.



Check your opportunities for Nuclear Navy duty.

Except for these changes, the requirements for both officers and enlisted men in the nuclear power program remain substantially the same as outlined in the previous instruction, BuPers Inst. 1540.40B.

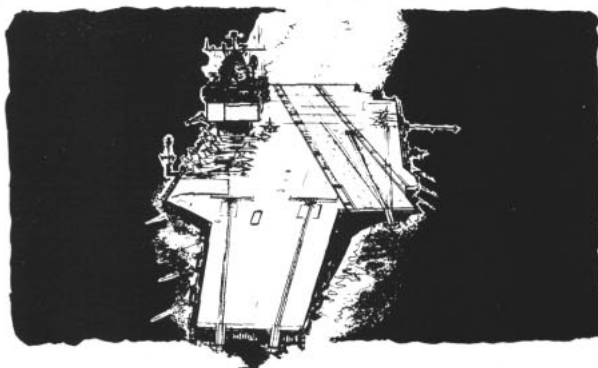
To gain initial nuclear power qualification, officers and enlisted men must complete a one-year course—six months' academic work at one of the Navy's nuclear power schools and six months' operational training at a nuclear power training unit.

For officers who hope some day to command a nuclear ship, the next step is to qualify as engineer officer. To be eligible for the Atomic Energy Commission engineer officer exam, an officer must be nuclear trained; must have qualified as engineer officer of the watch in a Navy nuclear propulsion plant; and must have served at least a year as an engineering department division officer in a nuclear ship. (However, the year need not be continuous, nor must it be served immediately before the exam.)

Additionally, submarine officers must be designated "qualified in submarines." Preparation for the exam is essentially an individual effort, although submarine officers may take advantage of the optional prospective engineer officers' course offered by the submarine force commanders.

Finally, whether in subs or on surface ships, he must be recommended by the CO of his current nuclear-powered ship, nuclear power school, or nuclear power training unit.

All prospective XOs from year groups 1961 and



USS Enterprise (CVAN 65).

junior must either have qualified as a nuclear engineer officer or passed a reactor safeguards exam administered by the AEC. To be eligible for the reactor safeguards examination, an officer from these year groups must have been assigned, not at his own request, to duties which have kept him from qualifying as an engineer officer. For example, some officers have reached the seniority required for an XO assignment without having had the opportunity to complete all the requirements for engineer officer. An alternative has been made available for these officers.

In either case, he must be nuclear qualified, qualified as engineer officer of the watch on a nuclear ship, and recommended for an XO assignment by the CO of his present (or last) nuclear ship.

Prospective commanding officers of nuclear ships (and prospective XOs of some surface ships) must complete a special AEC course before assignment as CO.

Warrant and limited duty officers will be considered for further assignments in the nuclear propulsion program only if they were designated as nuclear trained (enlisted) at the time of their original warrant or LDO appointment, and selected after interview by the Director, Division of Naval Reactors, AEC.

Enlisted men in the nuclear propulsion program become nuclear qualified by successfully completing the one-year course, and must be assigned an NEC in the 335X or 338X series as provided for in BuPers Inst. 1220.32 series.

Details of policies respective to qualification and assignment in nuclear power are in BuPers Inst. 1540.40C.

USS Bainbridge (DLGN 25).





principal arguments for and against ABM systems are presented.

*Disarmament and Soviet Policy, 1964-1968*; T. B. Larson — Russian leadership following Khrushchev has largely abandoned the policy of championing disarmament, according to author Larson. Real progress was and is unlikely, with agreements actually reached affecting peripheral rather than central matters. The author makes the observation that neither great power has found total security in armament and has had, of necessity, to turn to arms limitations and disarmament as the only alternatives.

*Naval Policy Between the Wars, I: The Period of Anglo-American Antagonism, 1919-1929*; S. Roskill — The increasing power of Japan was a concern to both the U. S. and England, but their relationship was such as to inhibit either from making adequate preparations to counteract Japan's naval strength.

*The War Business, The International Trade in Armaments*; G. Thayer — As most nations must buy the arms they believe they need, an understanding of how, where, why, from whom, and at what cost the weapons are bought is highly useful in assessing the military capabilities of such nations.

*German Navy in World War II*; E. P. Von der Porten — The problems of fighting effectively as the weakest of the contesting navies were well-nigh unresolvable, but the men and ships fought and performed well. Many of Germany's naval leaders of the time provided information for this study.

## FROM SECNAV

# GOOD READING

**S**ECNAV (through the SecNav Reading Program Committee) takes considerable trouble to compile periodically a list of books and articles which every Navyman, officer and enlisted, is urged to read. They are all timely and significant, and some of them are quite readable. Each will help you keep abreast of the rapid changes in the national and world situation.

Here's the most recent list, as contained in SecNav Inst 1520.5B, with a brief description of each title offered.

### Arms and Armament

*Soviet Sea Power*; Center for Strategic and International Studies — Coverage is given to naval forces, merchant fleet, fishing and intelligence fleet and oceanography. Russia is making a determined effort and the results are all too successful, says this study.

*Anti-Ballistic Missile: Yes or No*; Center for Study of Democratic Institutions — Two authorities speak for, and two against, an ABM defense system. The

*Nuclear Proliferation*; W. B. Wentz — In general, diffusion of atomic weapons is beyond effective control — treaties, wishes and conferences notwithstanding, says Wentz. The implications for American policy of this finding, the author believes, point to necessary adjustment if the U. S. is to avoid estrangement from and containment by a nuclearized world.

### Asia and Southwest Pacific

*Anatomy of a Crisis: The Laotian Crisis of 1960-61*; B. B. Fall — U. S. unfamiliarity with Southeast Asia led us into a series of decisions in Laos which pre-empted events in Vietnam and, to a degree, determined them. Fall gives his analysis of what really happened in Laos.

*Australian American Alliance: Costs and Benefits*; H. G. Gelber — Australia's security policies are closely linked to those of the U. S., and it is obliged to consider constantly the effects of changes in U. S. policy and to debate the advisability of lessening or strength-



ening that linkage. Written from the Australian viewpoint.

*Toward Disengagement in Asia*; B. K. Gordon — Gordon proposes a series of actions to achieve stability, multi-polarity and reduction of tensions caused by direct confrontation of the U. S. and regional Asiatic powers.

*America and East Asia*; R. Harris — This Far East specialist argues that East Asia (China, Korea, Japan, Vietnam) is different from the rest of Asia and from the West. Failure of the U. S. to recognize this fact and to rely on it in policy determination may mean a long, long war.

*Issues in the Future of Asia*; Edited by R. Lowenthal — Vietnam may be considered, in one sense, only a symptom of a much larger malaise. Asia must adjust and respond to pressures for change coming from several directions at once. This group of papers examines into the stresses to be encountered by the necessity of choosing between communist and non-communist ideologies.

*Okinawa: A Tiger by the Tail*; M. Morris — The land, the people, the past, and the problems of Okinawa are described, along with the approaches which might be taken to resolve the question of what happens to Okinawa and the U. S. bases there.

*Time Out of Hand; Revolution and Reaction in Southeast Asia*; R. Shaplen — An excellent survey of the nations of Southeast Asia in their current states. Shaplen feels that events have outraced the ability of the U. S. to respond properly and proportionately, but this is not necessarily a reason for complete withdrawal.

#### Europe

*Anatomy of Europe*; A. Sampson — Sampson is able to relate diverse elements, to recognize the importance of the seemingly trivial and innocuous, and to give meaning to diffuse movements.

*Awakening from History*; E. Taylor — As a Paris correspondent, Taylor ponders the meaning of significant events he has observed in the past 40 years. He writes not simply to record the things he has seen and done, but to explain what they meant to him initially and what they came to mean later in the perspective of time.

#### Foreign Policy

*Transformation of American Foreign Policy*; C. E. Bohlen — In the years following World War II, the U. S. crossed the line between isolationism and world involvement. What caused this change and what happened to U. S. foreign policy since is the subject of Bohlen's discussion.

*International Conflict for Beginners*; Roger Fisher — Not everyone can help negotiate solutions to international conflicts, but almost everyone does negotiate or support negotiations of some kind. A refreshing introduction to a skill much in demand.

*The Soviet Approach to Negotiations*; Selected Writings — This one describes, on the other hand, the

difficulties to be encountered in negotiations. Ten Westerners and four Russian sources bear witness to the quite different intentions and attitudes toward negotiations of the Soviet government.

*American Foreign Policy*; H. A. Kissinger — In three essays, Kissinger discusses foreign policy in terms of domestic influences, overreaching considerations, and negotiations over Vietnam.

*A New Foreign Policy for the United States*; H. Morgenthau — Morgenthau feels that U. S. foreign policy is attuned to an unreal world, one which ceased to exist some time ago. He suggests a set of principles which should guide and form our present policy.

#### Latin America

*Castro, the Kremlin, and Communism in Latin America*; D. B. Jackson — Jackson finds Castro and Russia involved in a contest for leadership rather than comrades in arms.

*Dagger in the Heart*; M. Lazo — A disillusioned man, Lazo believes that the results of recent U. S. actions have been to establish a sanctuary for Castro and a protected staging area for communist infiltration of Latin America. Nevertheless, he foresees the eventual collapse of Castro's regime.

#### Management

*Mastery of Management*; Auren Uris — Uris has much to say to military executives, particularly younger officers, about the practice of leadership in a rapidly changing environment.

#### Middle East

*Birth of Israel*; H. Feis — An understanding of just what miraculous diplomatic combination enabled Israel to achieve legitimate, recognized existence is essential to an understanding of current difficulties. Feis explains that combination well.

*Soviet-American Rivalry in the Middle East*; J. C. Hurewitz, ed. — The U. S. and Russia are at odds in various aspects of regional policy. These papers, stemming from a conference sponsored by the Academy of Political Science, provide a view of the rivalry, its current status, and its possible lines of development.

*Middle East Politics — The Military Dimension*; J. C. Hurewitz — Essentially a military geography of the Middle East. Each state receives individual attention and separate chapters cover such elements as historic backgrounds, arms races, and U. S. options.

#### Russia

*Power in the Kremlin*; M. Tatu — Indispensable to those who would try to understand the inner workings of Russia in the '60s. Helps in understanding the actions of the present government.

#### Social Psychology

*Denazification*; C. Fitzgibbon — Men fight primarily against ideas rather than people, says Fitzgibbon. But, having won, how does one go about eradicating the ideas? Reconstruction is usually a difficult job, as

## bulletin board

this review of denazification in Germany indicates.

*Prejudice, U. S. A.*; C. Glock & E. Siegelman, editors — The theme discussed by the authors is that the United States, as a nation, is afflicted with both prejudice and discrimination; yet is officially dedicated to their elimination. That this will not be easy to achieve is made clear in this volume.

*Responsibility in Mass Communication*; W. L. Rivers & W. Schramm — In its revised edition, this continues to be an excellent introduction to the role of the mass media in our society.

### Student Unrest

*Confrontation, the Student Rebellion and the Universities*; Daniel Bell & Irving Kristol, editors — Some of the crises at American universities are analyzed in separate studies in this collection, while other papers deal with such general problems as the generation gap. A useful introduction to a most serious problem area.

*Conflict of Generations*; Lewis S. Feuer — An analysis of the history of student movements in the Western nations in support of the author's hypothesis that generational conflict results when the older generation loses its authority and credibility. As a universal theme, says Feuer, the conflict of generations is lit by idealism and characterized by an irrational drive to disaster.

### War in Many of Its Forms

*Truth Is the First Casualty*; J. C. Goulden — Just what happened in the Gulf of Tonkin incident, and

the effects on the course of the war in Vietnam, on administration/Congressional relations, on future naval policy, and all the rest, are the subjects of this study. Goulden is inclined to question what really took place and if it did occur, as reported, he says the enemy was conned into it. In any event, he makes the charge that the incident seriously eroded Americans' faith and belief in their country's leadership. Obviously a critical book.

*The Way We Go to War*; Merlo J. Pusey — Pusey feels that the Congress has allowed presidents to usurp its authority to declare and conduct war. He makes a number of debatable recommendations, including a War Powers Act which would set limits to Presidential power and require congressional approval in certain instances.

*The President and the Management of National Security*; K. C. Clark & L. J. Legere, editors — Every President since WW II has had to cope with the problem of how to organize and apply decisions which affect national security. There's just too much of everything. Each has sought a personal solution keyed to his own policies, outlook, mode of administration and system of priorities.

*Art of Winning Wars*; J. Mrazek — Mrazek develops the thesis that creativity is the key to military victory and that guerrillas are more creative than regular forces. He asks for greater creativity in our military organizations.

*Intelligence at the Top*; K. Strong — As the head of intelligence for the Supreme Allied Command in WW II, Strong was in a position to observe major leaders and to relate the tasks of intelligence to operational needs.

### Signature Authority Granted Master And Senior Chiefs in Some Instances

Master and senior chief petty officers: fill your pens. The word has been passed. If so delegated by your commanding officer, you are now authorized to sign certain administrative paperwork, officially.

The announcement was made on 15 January through BuPers Notice 5210. In it, BuPers authorizes COs to delegate "signature authority" to master and senior chief petty officers within their command.

This means that MCPOs and SCPOs are authorized to sign such documents as service record entries, discharge certificates, separation forms and enlisted orders written in the field. They may also initial facsimile signature stamps, and sign leave papers, liberty passes and identification cards as issuing or authorizing officer.

However, the delegation of signature authority to master and senior chief petty officers may not be extended to signing "by direction" correspondence dealing with the accountability of public funds, the administration of oaths of enlistment or signing correspondence or orders to officers.

Appropriate changes to the *BuPers Manual* (specifically, Articles 1810180, 1810200, 3020300, 3030200, 3850160, 4620150, 5030100, and 5030120) are forthcoming.

### Borrowing Books by Mail

The books recommended here are available through shipboard libraries and the general libraries at shore bases insofar as funds are available. Individuals may borrow books on the list by mail, directly from the following Navy Auxiliary Library Service Collections:

● Chief of Naval Personnel (Pers-C46), Department of the Navy, Washington, D. C. 20370, for personnel in Northeast, European, Mediterranean, and Middle East areas.

● Commanding Officer, U. S. Naval Station (Library-ALSC), Bldg C-9, Norfolk, Va. 23511, for personnel in Southeast and Caribbean areas.

● Commanding Officer, Naval Station (Library-ALSC), San Diego, Calif. 92136, for personnel in Midwest, Southwest, and Pacific Coast areas.

● Commanding Officer, U. S. Naval Station (Library-ALSC), Box 20, FPO, San Francisco, Calif. 96610, for personnel in Central Pacific area.

● Commanding Officer, U. S. Naval Station (Library-ALSC), Box 174, FPO, San Francisco, Calif. 96630, for personnel in the Far East and the Marianas.

### AFTA: A School in Avionics at NAS Memphis

The initial class of the Advanced First Term Avionics program has been graduated at NAS Memphis.

The 26-week AFTA course provides training in electronics theory, circuit analysis and test equipment.

Graduates are said to be qualified to perform the technical duties of petty officer 2nd class in any of the ratings which compress to Avionics Technician (AV) at the Master Chief Petty Officer level. These are Aviation Antisubmarine Warfare Technician (AX); Aviation Electronics Technician (AT); Aviation Fire Control Technician (AQ); and Aviation Electrician's Mate (AE).

Training under AFTA provides automatic advancement to petty officer 3rd class after completion of AV "A" school. Next is the new AFTA course, followed by class "C" school.

The AFTA course is divided into six weeks of specialized training in either the AQ or AT ratings, plus 20 weeks of advanced avionics training.

Most of the current AFTA students were recruited from AV "A" school, but the course already is attract-

ing Navymen from elsewhere. For example, 40 of the students were recruited for AFTA before they enlisted or during boot camp.

The students themselves testify to the quality of the new training. AQF3 Michael W. Comfort earned an associate degree in electrical technology from an eastern university before entering the Navy.

"My college training provided a general background, but I wanted to concentrate in one field. AFTA tops any college training I've seen."

AQF3 Gary R. Iversen said the final phase of the course, avionics maintenance, impressed him the most.

"During this phase you do practical work. You actually work with the theories and skills you have learned."

Petty Officer Iversen holds an associate degree in general applied science from American River College, Sacramento.

Eventually there will be a weekly input of 43 students into the new course, with approximately 1000 trainees on board at all times. The instructor staff will number about 170.

## Uniform Changes: Pockets for White Trousers, UDT and SEAL Insignia

Have you ever been troubled with a lack of pocket space to hold needed personal articles? The Navy Uniform Board recognizes that the majority of enlisted personnel have faced this problem with the present white trousers and has moved to remedy this situation.

The Chief of Naval Operations has recently approved side pockets, back pockets and a zipper-fly front for the conventional white trousers now worn by enlisted personnel below Chief Petty Officer.

The process of ordering and stocking the new bell-bottoms has begun. It normally takes in excess of one year for the supply to reach the shelves in your clothing and small stores. The present style trousers will, of course, remain regulation until stocks are exhausted.

These additional uniform changes were also announced in BuPers Notice 1020 of 22 Nov 1969:

- Officers may now wear the reefer (the short overcoat similar to the enlisted man's peacoat) with either the working or service dress blue uniforms. If local regulations allow, it may be worn off base as well as on.

(The reefer is an optional uniform item for officers. It is also issued to Naval Academy midshipmen.)

- Breast insignia for SEAL and UDT personnel have been approved. The UDT pin consists of a crossed anchor and trident with an old-style pistol. The SEAL insignia is the same, but with a spread eagle behind the anchor. Officers' insignia will be gold, enlisted men's silver. The pins will soon be available through many Navy Exchanges and commercial sources.

- Officers may now wear the full dress uniform without the sword on certain occasions when the

proper authority considers wearing the sword "inappropriate or undesirable." For example, officers on platforms or stands at ship launchings might be directed to omit the sword, or those participating in ceremonies in churches, where swords have been properly left in the vestibule in the past.

Provisions of the notice are to be incorporated in *Uniform Regs.*



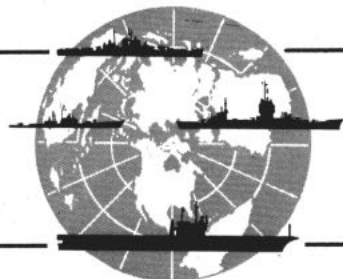
UDT Insignia



SEAL Insignia



# Letters to the Editor



## Sea Duty for ET B Graduates

SIR: I am attending an ET Class B School and, for planning purposes, I would like to know if B School graduates must return to sea duty regardless of their Seavey-Shorvey status.

I would also like to know if it is possible for a Navyman to refuse one set of orders and request another.

—G. I. H.

• *Students of ET Class B Schools are usually assigned ashore immediately after graduation only if there is an urgent need which can't be met by assigning men still at sea or others who might be eligible for Seavey.*

*Inasmuch as the odds are against an overwhelming need for your services ashore, you probably would be wise to plan on a return to sea duty upon graduation regardless of your Seavey-Shorvey status when you were assigned to Class B School.*

*We might add that most students of Class B ET School are assigned to sea duty after graduation. However, after 12 months aboard their new command, they are eligible for assignment ashore.*

*If you want to look up the official word on the subject, you can find it in Article 12.82 of the "Enlisted Transfer Manual" which says school graduates may be returned to sea even if Seavey-eligible when first assigned to school.*

*With regard to rejecting one set of orders and holding out for another which may be to your liking—we advise against it.—Ed.*

## AX Rating Is Alive and Well

SIR: Since I have more than one question, perhaps the best approach to this letter is to list them. They all pertain to the same subject—the Aviation Antisubmarine Warfare Technician (AX) rating.

First: Is the AX rating going to be disestablished?

This section is open to unofficial communications from within the naval service on matters of general interest. However, it is not intended to conflict in any way with Navy Regulations regarding the forwarding of official mail through channels, nor is it to substitute for the policy of obtaining information from local commands in all possible instances. Do not send postage or return envelopes. Sign full name and address. Address letter to Editor, ALL HANDS, Pers G15, Bureau of Naval Personnel, Navy Dept., Washington, D.C. 20370.

Secondly: Since many AX personnel have changed to AQ, AT, and AW ratings, will the complement percentage figures be reevaluated for a new pro pay level?

Thirdly: Will the AX rating become eligible for recruiting duty in the near future?—AXCS G. E. R., USN.

• *No. No. And a possible Yes, in that order. However, the AX rating controllers give this more detailed explanation.*

*At the time the Antisubmarine Warfare Operator (AW) rating was established, many AX billets were changed to AW billets and AXs were invited to convert to the new rating. As a result, nearly all AW billets were filled by former AX personnel at the outset. However, the AX rating is still in.*

*This shift has not reduced the number of AXs to the critical-need level, and so the rating was removed from the list of eligibles for variable reenlistment bonus and proficiency pay (P2-\$75), effective 1 Jul 1969.*

*Although the AX rating is not included in the ratings eligible for recruiting duty at this time, it may become eligible during the current reappraisal of the rating. In fact, some AXs have been recently assigned duty as recruiters, but only on a trial basis.*

*Meanwhile, the AX rating will continue to be part of the Aviation Antisubmarine Warfare Program, and those holding the rating will perform*

*a role similar to that performed by the AQ rating in attack and fighter squadrons. That means maintaining the mission hardware with the emphasis placed on ASW equipment.*

—Ed.

## O'Bannon and Her Potatoes

SIR: I'm in the middle of a heated argument with several disbelieving fellow instructors about one of my previous duty stations, USS O'Bannon (DD 450), which is being decommissioned this year.

I know for a fact that she was credited with the sinking of a Japanese submarine during World War II—using Maine potatoes as her ordnance. The Potato Growers Association of Maine even donated a plaque for the ship's quarterdeck commemorating the event.

I hope you will back me up by printing the true story on this. The most emphatic nonbelievers, as you might guess, reside in the submariner ranks.—ST1 A. O. H., USN

• *This tale has been circulated rather widely, as all good sea stories are, in several versions. Also like most of them, it isn't true.*

*O'Bannon did (perhaps) sink a sub, or at least damage it. As a matter of fact, we understand that the potato growers' plaque is real, too. But there's no indication in any official records that she ever used potatoes anywhere but the wardroom and mess decks.*

*Yours is the first version we've come across that claims the sub was actually sunk by a potato barrage. As usually told, the story goes this way:*

*O'Bannon caught the submarine RO 34 on the surface on 5 Apr 1943 in the Solomons. Her gunfire damaged—or blasted off, depending on which account you read—the sub's conning tower. The Japanese skipper maneu-*

vered his boat in close to the destroyer, too close for the DD's guns to be brought to bear, and enemy sailors began pouring out of the hatches, firing small arms at the ship.

All of O'Bannon's small arms were in the armory below decks, the story says, so the crew began throwing potatoes at the Japanese. They knocked one enemy sailor off the sub into the water, and frightened the others into thinking that the spuds were hand grenades, so many of them jumped over the side. In the confusion, the destroyer was able to move off and sink the sub with her 5-inch guns—using regulation ammo.

We must admit, that version of the story strains our credulity less than your claim that the tubers sank the sub. With minor variations, it has appeared in several unofficial published accounts. But as far as we can tell from available records, it isn't true either.

O'Bannon turned in an action report on the incident which made no mention of potatoes. According to her official history, she did catch the sub napping on the surface, and scored hits on the conning tower—with guns, not potatoes. But the enemy vessel submerged, and O'Bannon made three depth-charge runs to sink it.

Postwar research has cast considerable doubt on whether O'Bannon really sank the sub, or just damaged it. USS Strong (DD 467) is now generally credited with sinking RO 34 on 7 Apr 1943, although O'Bannon was originally awarded a battle star for the deed.

One very good reason for this revised judgment—Imperial Japanese Navy records show that RO 34's final radio transmission was received on 6 April—the day after O'Bannon was reported to have sunk her.

However, O'Bannon was involved in one more antisubmarine action in the war. On 31 Jan 1945, west of Mindoro, she engaged the sub RO 115 in company with two other destroyers and a DE. The sub was underwater when the action began, and was sunk with depth charges and hedgehogs. Nothing else. No vegetables.

Two other WW II incidents, both in the Atlantic, bear some similarity to your story.

USS Borie (DD 215) engaged the German sub U 405 on 1 Nov 1943 in a surface duel. The destroyer finally rammed the U-boat. While the two vessels were locked together, their crews fought it out at pointblank range with hand weapons. Some of Borie's crew threw empty shell cases; one fired a Very pistol at the sub's bridge. The DD later sank the sub.

And on 6 May 1944, USS Buckley (DE 51) attacked and rammed U 66 in the South Atlantic. The ships were locked together and couldn't bring their guns to bear. The sub's crew tried to board Buckley; in a melee on the DE's forecastle, the Americans hurled empty shell cases, coffee mugs and anything else that could serve as missiles at the Germans. They finally prevailed, taking 10 of the would-be boarders prisoner.

The vessels separated, the U-boat rammed Buckley again, and the DE hit the sub with pointblank gunfire while her crew threw (real) hand grenades down the conning tower. Flaming fiercely, the sub pulled away, sank almost immediately, and exploded underwater.

One of these true stories may have evolved into the story you tell. Scuttlebutt does stranger things every day.

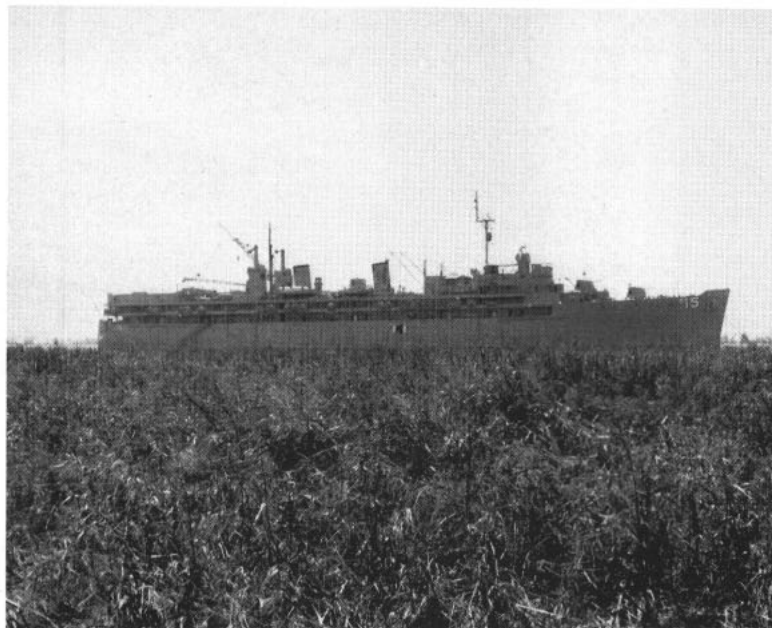
Irish potatoes for a ship named O'Bannon? It does make a fine story for sure. But we must say, with our friends in the Naval History Division of OpNav backing us up, that it appears to be pure blarney.—Ed.



**AVIATORS' LADDER**—Shown here are Navy pilots Jim Swanson and John Leonard after their plane lands on the flight deck of USS Coral Sea (CVA 43)

**New ammunition ship USS Butte (AE 27) is now providing service to ships of the U. S. Atlantic Fleet.**





USS BUSHNELL (AS 15) is not stranded in the middle of a prairie as the photo appears to indicate. She is actually anchored, with water under her keel, near Pilottown, La., providing supplies and aid to Hurricane Camille victims.

## Advancement Factors

SIR: In the past few years I've talked to many senior YNs and PNs about the factors which determine whether or not a man is advanced.

All seem to agree that a curve is used to grade the advancement exam, based on the individual who makes the highest score. I've also heard that a man who fails the military section of the exam has automatically failed the whole test.

Is my understanding on these points correct? I think all your readers would be interested in information on the subject.—YN1 W. E. M., USN

• We do too. There aren't many subjects that produce more messdecks speculation than advancement.

The "Advancement Manual" is designed for use by local commands, so it gives hardly a clue about how the Navy decides that one man is advanced and another isn't.

To get the official word on what factors determine advancement, we wrote to the Naval Examining Center, NTC Great Lakes. Here's the gist of their reply:

Most scores in a given examination will be bunched around a certain level—the "mean score," which is the

score that has an equal number of other scores above and below. On an especially difficult test, the mean score might be 40 (that is, half the men taking the test scored above 40 and half scored below). For an easier exam in a different rate or rating, the mean might be 60.

A curve is constructed for each rating and pay grade individually, based on this mean score (not on the highest score). "Raw scores"—the scores made by the men taking the test—are translated into "standard scores" on the curve, with the mean score counting 50 in the standard scale, no matter how high or low it is in raw form.

As we've pointed out, the curve is a separate one for each rate, taking into account the difficulty of the test. A man going up for GMT2 is competing only against other men who are trying for GMT2, not against men taking exams for BM2 or GMTC. If he does better than average for the GMT3s taking the test, he'll have a standard score over 50; for instance, if he answered 90 of the 150 questions correctly and the mean score was 80, he'd be in the top half of the test results—even though his raw score is only 60 per cent.

Advancement opportunity is then

computed by determining each test passer's final multiple. Computation and the weight assigned to each of the final multiple factors is as follows:

Maximum Points Allowed	Factor	Weight (in percentage)
80	Exam Score	43
50	Performance	27
	(Averages of marks)	
20	Total Active Service	11
	(One per year)	
20	Time in Present Grade	11
	(Two per year)	
15	Awards	8
	(Specified Pts/Medal)	
185 points maximum possible		100

As you can see, the examination score is heavily weighted, but a man could make a rather poor score on the exam and still have a high final multiple. However, he must make a passing score on the test or he won't be eligible for advancement, no matter how high the other parts of the multiple may be.

In ratings in which more candidates pass the exam than the Navy needs, the men selected for advancement are the ones with the highest final multiples. On the other hand, in ratings without any quota limitations, everyone who passes the exam is advanced, and the final multiple is used to determine in which month you will be advanced. The highest multiples are advanced first.

As for your question about the "military section" of the exam: we assume you're referring to the tests for PO1 and CPO, in which military questions are included in the same test with professional items.

In these exams, "failing" the military section does not necessarily mean failing the whole test. The overall score is what counts. Since there are only 30 military questions in the 150-question exam, a man who did well on the 120 professional questions could make quite a respectable score, even if he missed most of the military section.

However, it's a different matter for the lower pay grades. Candidates for PO3 and PO2 must pass a separate military-leadership exam before they can be eligible to take the professional test for advancement.—ED.



## Overseas Waves

Sir: I understand there are Wave billets in Europe and Hawaii. Are any of these for Hospital Corpsmen? I'm interested in overseas duty, but thus far have been unable to locate a listing of Wave HM billets.

Is there such a list?—HM3 D. H. K., USN.

• There is no such list, since billets are not identified as Wave billets, except for certain key billets connected with recruiting, administration and training of enlisted women which are filled by selected petty officers.

A Wave may be assigned to fill any vacant billet for which qualified, in any rating in which women serve. At present, there are a number of Waves stationed in Europe and Hawaii, including Waves in the HM rating.

Chapter 14 of the Transfer Manual explains assignment and rotation policies for enlisted women. Here are some pertinent points on the opportunity for overseas duty:

—Waves are assigned principally to commands within the continental United States and are not subject to sea/shore rotation. Enlisted women also are assigned to selected overseas



USS Green Bay (PG 101) is shown underway to commissioning at Boston Naval Shipyard.

areas suitable to the assignment of women.

—Overseas duty is considered special duty and falls under special Wavevey assignment procedures (article 14.7, Transfer Manual).

—After a minimum of one year at your current duty station, a request for special overseas assignment may be forwarded to the Chief of Naval Personnel (Pers-B2114) on the Enlisted Transfer and Special Duty Re-

quest (NavPers 1306/7).

—The request must contain the Commanding Officer's endorsement concerning qualifications and suitability for this special duty. The request must also be addressed via the appropriate Enlisted Personnel Distribution office.

—The normal tour for Waves assigned overseas is two years. You must have sufficient obligated service to complete the overseas duty.—Ed.

## Technical Writer and Adviser Billets

SIR: According to the Enlisted Transfer Manual, Technical Writer/Advisor billets must be filled through a request for instructor duty.

Is there any provision whereby assignment as a TW/A only may be requested?—SKC A. W. B., USN.

• TW/A billets may be requested by one of two methods: either by individual request or by indicating your wishes when you submit your Seavey data card. If selected, you will be ordered via instructor school.

However, don't make any firm plans until your request is approved.

To give you some idea of the limited numbers, here's a list of the billets by rate and rating at the two activities in the Navy which have the greatest demand for Technical Writers/Advisors.

In the left column are listed those rates required at the Training Pub-

lications Division in Washington, D. C., where the "Blue Book" training manuals are written.

On the right are listed those bil-

lets at the Training Publications Center in Memphis, where the aviation "Green Book" training manuals are prepared.—Ed.

### TPD Washington Rate

	E-7	E-8	E-9		E-7	E-8	E-9
BT	2	1		GMT	1		
BU	1			IC	1	1	
CS	1			JO	1		
CM	1	1		LI	1		
DC	1			ML	1		
DP	1			MM	1	1	
DS		1		MT	1		
DT	1	1		OM		1	
EA	1			PN	1		
EM	1			QM		1	
EN	1	2		RD	2	1	1
EO	1			RM	2	1	
ET	1	1		SF	1		
FT		2		SK	1	1	1
FTG	1			SM		1	
FTM	1			ST	1		1
GM		1	1	TM	1		
GMM	1			YN	1	1	

### TPC Memphis Rate

	E-7	E-8
AB		2
AC		1
AD		1
AE		1
AG		1
AK		1
AM		3
AO		1
AQ		1
AS	1	
AT	1	3
AW		2
AX		1
AZ		1
PH		1
PR		1
PT		1

SIR: We often hear about the actions and achievements of Navy personnel, but infrequently do we hear anything about the women serving behind these men—the Navy wives. There's the old cliché, "Behind every successful man stands a woman," but it is most befitting, and really applicable when applied to a successful Navyman.

It is his wife who maintains the equilibrium of his comparatively unstable existence; who keeps the "home fires burning" while he is deployed; who gives him the moral support and underlying strength to endure and rise

### The Navy Wife

above the frustrations, tensions, conflicts, and divisions encountered in his seagoing career.

She is the reason that the Navyman continues to serve. It is her courage and strength that help give him the will to continue to struggle in the fight for freedom.

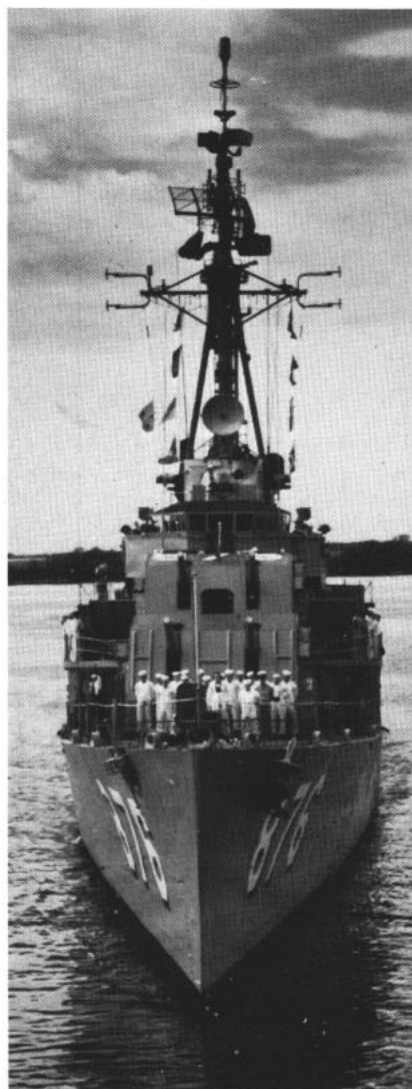
The Navy wife must at times be both father and mother, chauffeur and landlord, but she is still a woman who loves her man, and who needs his love in return. The many months of deployment would be enough to break the spirit of many a woman, but the Navy wife's love runs deep. She endures,

knowing that he will return soon—although he just left today, he will be back "the day after tomorrow." She accepts and leads this double life with understanding for she knows this is the chosen career of her man, and she asks nothing but his love in return.

The Navy most certainly owes a debt of gratitude, and very much more, to these distaff "Landlubbers" who are in a large sense responsible for the success of our naval forces upon the high seas.—YN2 Raymond W. Rugen, USN.

• *All that we can add is Amen!*—ED.

USS Rogers (DD 876), ported in San Diego, gets underway at Pearl Harbor.



### Scrambled Eggs

SIR: What does the gold braid "scrambled eggs" ornamentation on the caps of senior officers symbolize? Nobody, enlisted or officer, seems to know.

Seaweed, maybe?—GMG1 J. L. B., USN.

• You've got to be putting us on, but we'll play along.

As far as we know (after checking with the Uniform Board), the embroidered oak leaves and acorns on the visors of senior officers' caps have no specific meaning. They're just decoration, intended to differentiate classes of officers. The more rank, the more gold.

In 1830, the caps of all officers had blue bands except for the three senior grades—captain, master commandant and lieutenant. These three wore inch-and-a-half bands of gold lace.

Today, as you know, flag officers have a visor covered with oak leaves and acorns; captains and commanders have one row of leaves and acorns; and officers below commander wear a plain leather visor.

For well over a hundred years, oak leaves and acorns have been used in naval insignia—in staff corps devices, for instance—standing for the oak timbers in early ships. Oak symbolizes strength, seaworthiness, reliability, and other good qualities of the Navy.

For example, the Royal Navy still sings a rousing song written by David Garrick more than 200 years ago, which extols the solid strength of

British ships and seamen in such words as:

Heart of oak are our ships,  
Jolly tars are our men:  
We always are ready.  
Steady, boys, steady,  
We'll fight and we'll conquer again and again.

But mainly, symbolic or not, oak leaves and acorns just look good. Ask any former lieutenant commander who's just been promoted.—ED.

### Jim Texas of Staffordshire

SIR: Jim Texas, whose picture appeared on page 27 of the December 1969 issue of ALL HANDS Magazine and who was the subject of Captain L. Wainwright's Letter to the Editor, was not a bulldog or a bull pup as the letter said.

Actually, he was a Staffordshire Terrier or an American Pit Bull as the breed was called in 1918—the year Jim came aboard USS Texas.

Although it had been pure and true for more than a hundred years before 1918, the breed wasn't officially recognized as the Staffordshire Bull Terrier by the British Kennel Club until 1935. Recognition as the Staffordshire Terrier by the AKC came in 1937.

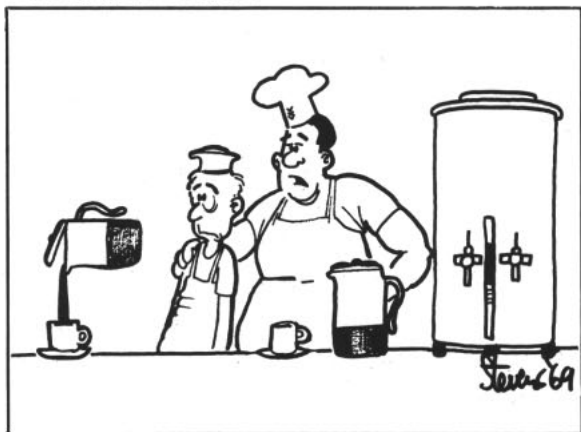
Probably a number of military units have had dogs of this breed as mascots. I know of one—the Marine Corps Recruit Depot at San Diego which had a Staffordshire Terrier called Skipper as a mascot in the early 1950s.

—FTC Bert W. Hahn, USN (Ret).

• They must breed 'em tough in Staffordshire.—ED.



"Don't tell me you forgot to secure everything again!"



"Well, I know it's only the first pot you ever made... but I think it's going to be a little strong..."



"Just for the record—what size did you want?"



"Now I suppose you're going to give me some long-drawn-out, sad tale about how long you've been waiting!"



# TAFFRAIL TALK

**N**AVY WEATHERMEN are experts, sure enough. But Aerographer's Mate 1st Class Al Atherton is in a league by himself.

Matter of fact, there was a time this winter when superstitious Navymen at Naval Air Station South Weymouth, Mass., might have suspected Al of being in league with *something*.

It began when a Boston radio station asked its listeners to guess the date and time of the winter's first two-inch snowfall at Logan International Airport. The deadline for contest entries was 1 November.

Al consulted the clouds (or maybe the stars) and prophesied that the storm would come at 12:45 a.m., 15 December.

At 12:50 on the predicted day, the snow began.

AG1 Atherton now has a new \$385 snow blower for winning the contest—and, naturally, a reputation for accurate forecasting.

**F**OR MOST FAMILIES, a dachshund or parakeet is more than enough to handle in the way of household pets. Some of us never get beyond the goldfish stage.

Not Seaman Apprentice Richard Jackson's family. They think big—the size of a 700-pound moose.

Granted, Millie the moose wasn't as hard to raise on their 4000-acre spread near Dillon, Mont., as she might be on the top floor of a high-rise. And they didn't have much trouble from the standpoint of feeding, since they were also providing for a sizable herd of cattle on the ranch already.

Richard tells how Millie came into the family's life:

"I was out riding one day and there was the moose lying in the snow. I noticed that it was almost frozen to death and only about three days old, so I carefully placed it across my saddle and took it home."

Trouble was, Millie wouldn't take a bottle. The Jacksons found a convenient solution.

"We decided to try and see if Millie would take nourishment from a milk cow," Richard recalls. "The cow didn't mind and the moose didn't, so they got along quite well."

Her diet agreed with her so well that by the end of the year, the moose had grown to 700 pounds, about half of her adult weight. Despite her size, she gave the family few problems.

"Millie was quite playful," says Richard. "She used to chase the milk cows, but that wasn't really a problem. Our biggest problem was the constant picture-taking of passersby."

When she was a year old, the Jacksons decided to take Millie to a game preserve in nearby Challis, Ida. A 1400-pound pet might be all right on a ranch, but imagine moving it from one duty station to another!

*The All Hands Staff*

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Interesting story material and photographs from individuals, ships, stations, squadrons and other sources are solicited. All material received is carefully considered for publication.

There's a good story in every job that's being performed either afloat or ashore. The man on the scene is best qualified to tell what's going on in his outfit.

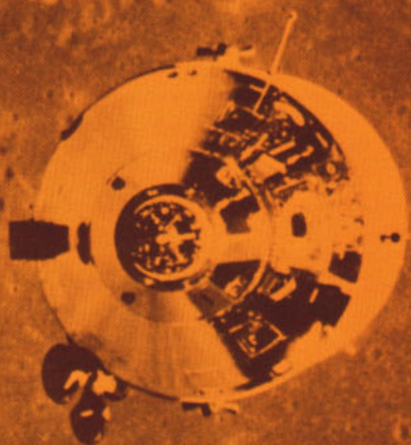
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Address material to Editor, ALL HANDS, Pers G15, Navy Department, Washington, D. C. 20370.

• **AT RIGHT: ALL SMILES** — A crewman from the aircraft carrier USS Bon Homme Richard (CVA 31) is greeted following the ship's arrival at the Naval Air Station, North Island, San Diego. Photo by PH2 Wayne W. Massie, USN.







*in this issue:*  
**THE NAVY'S ROLE in SPACE**

